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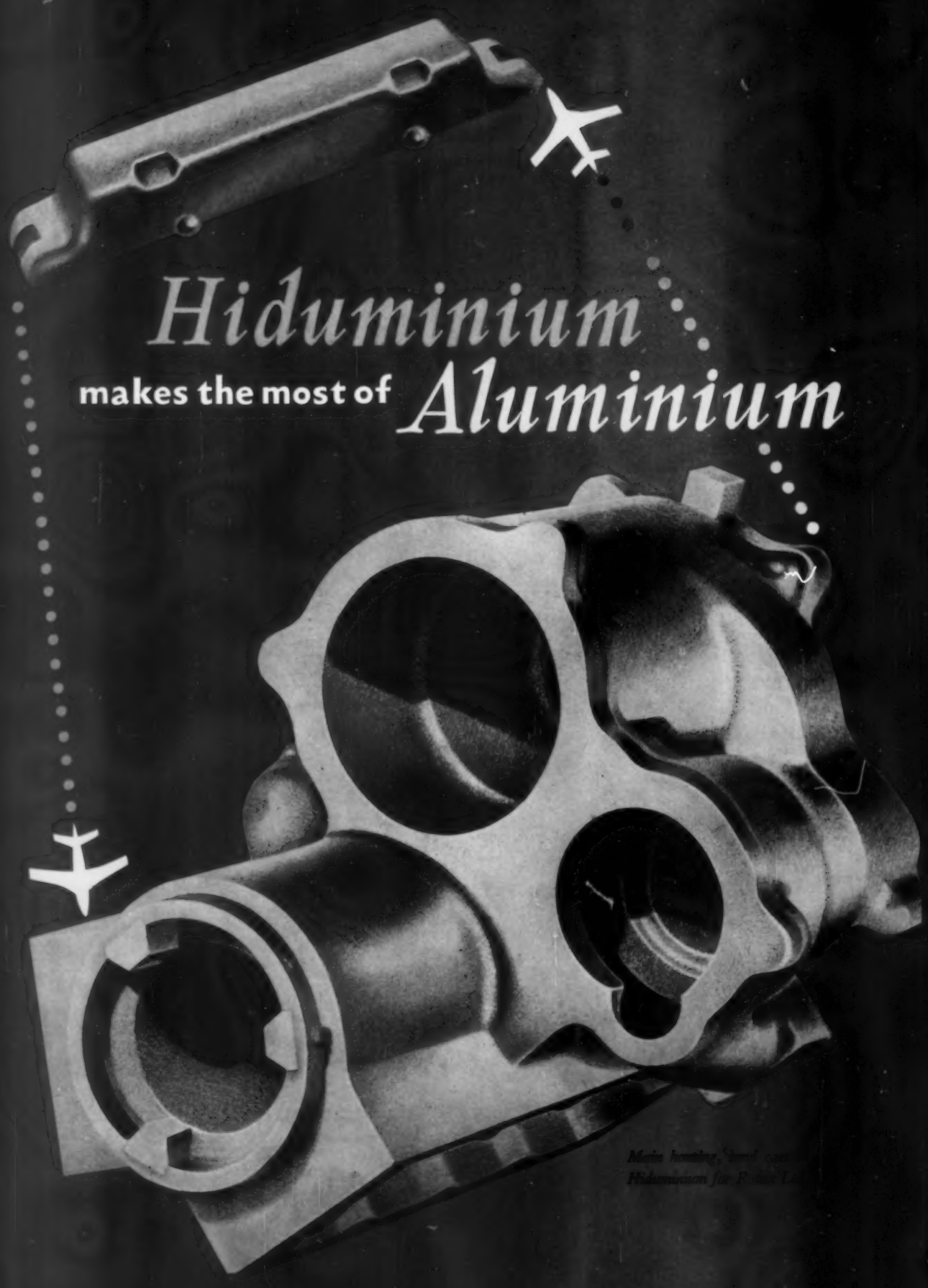

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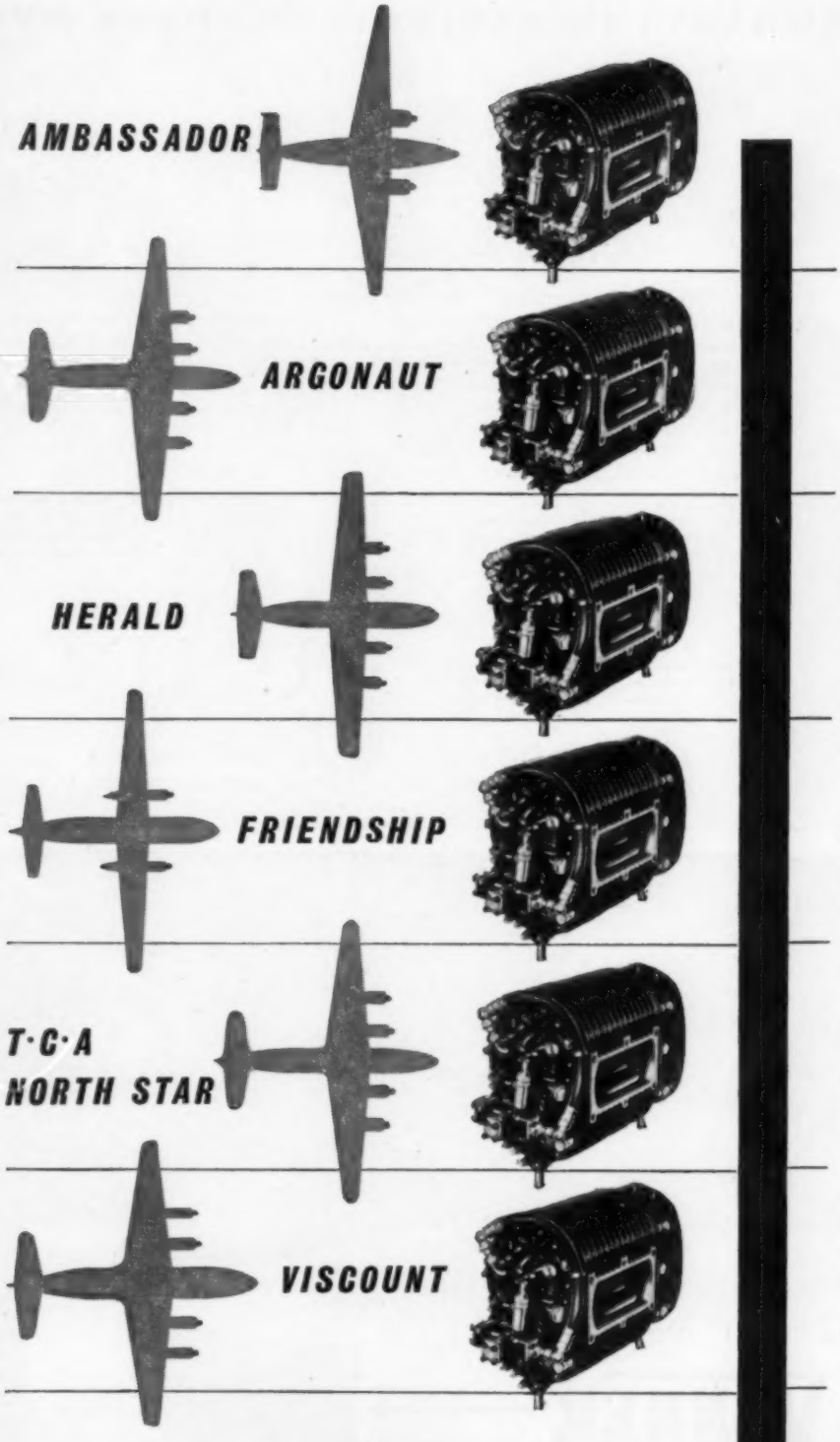

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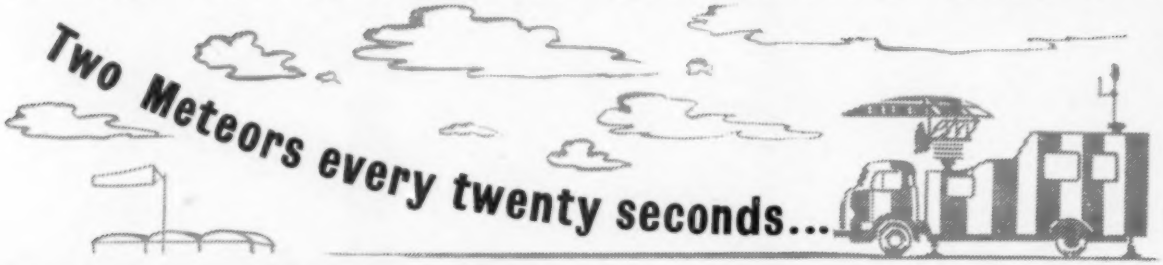

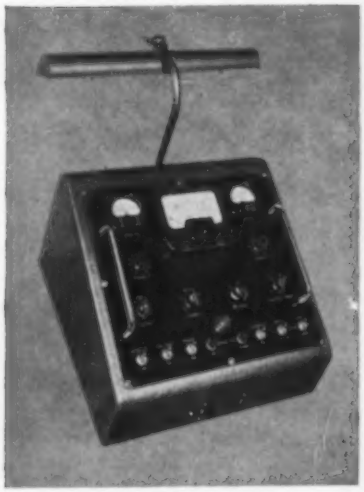

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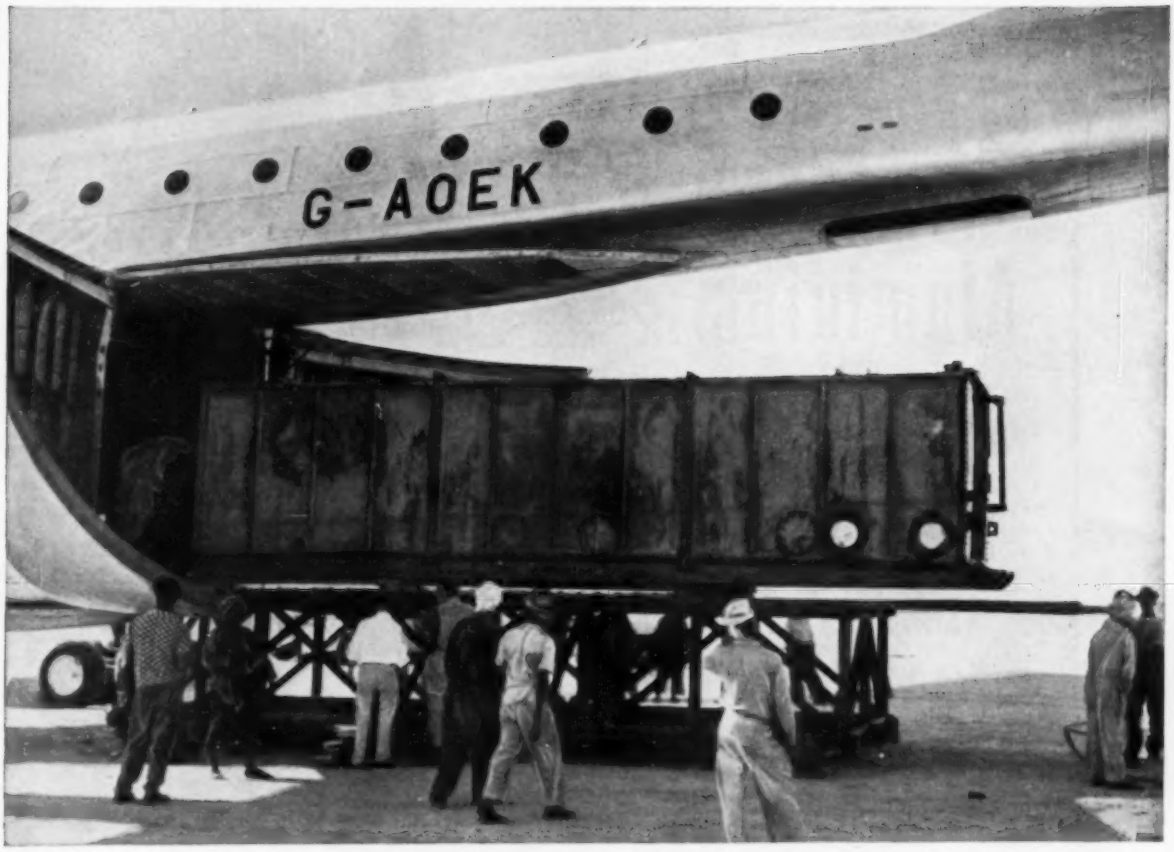

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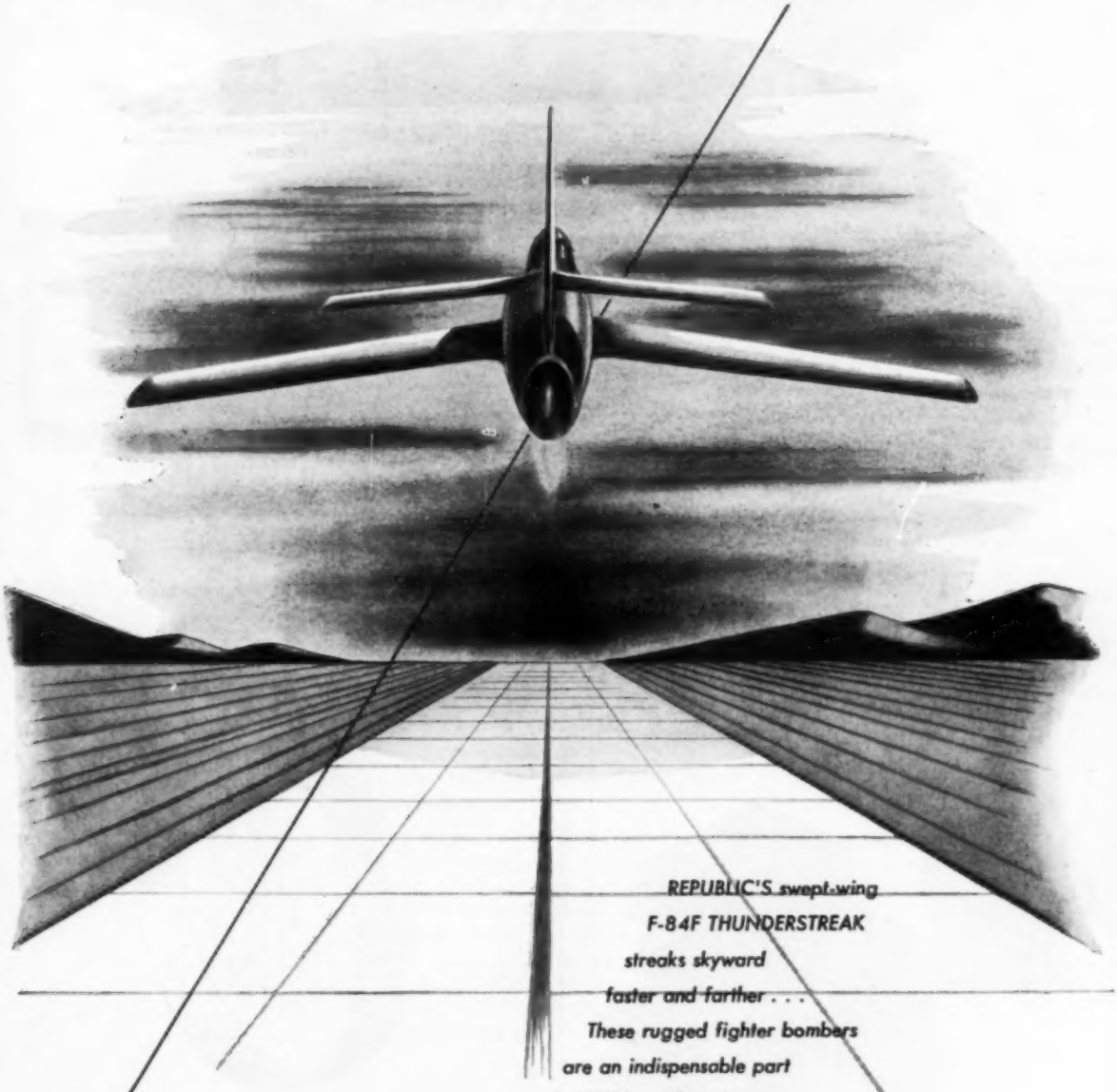

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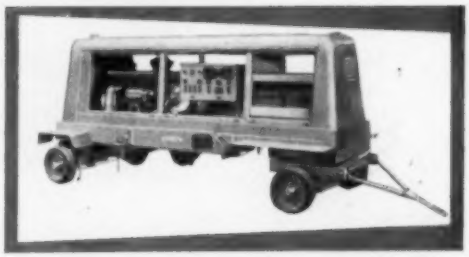

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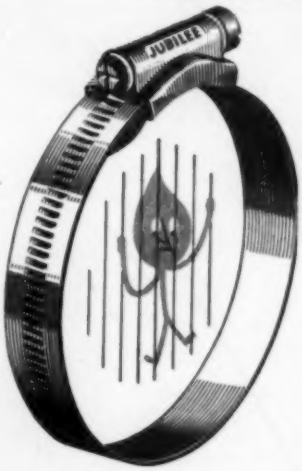

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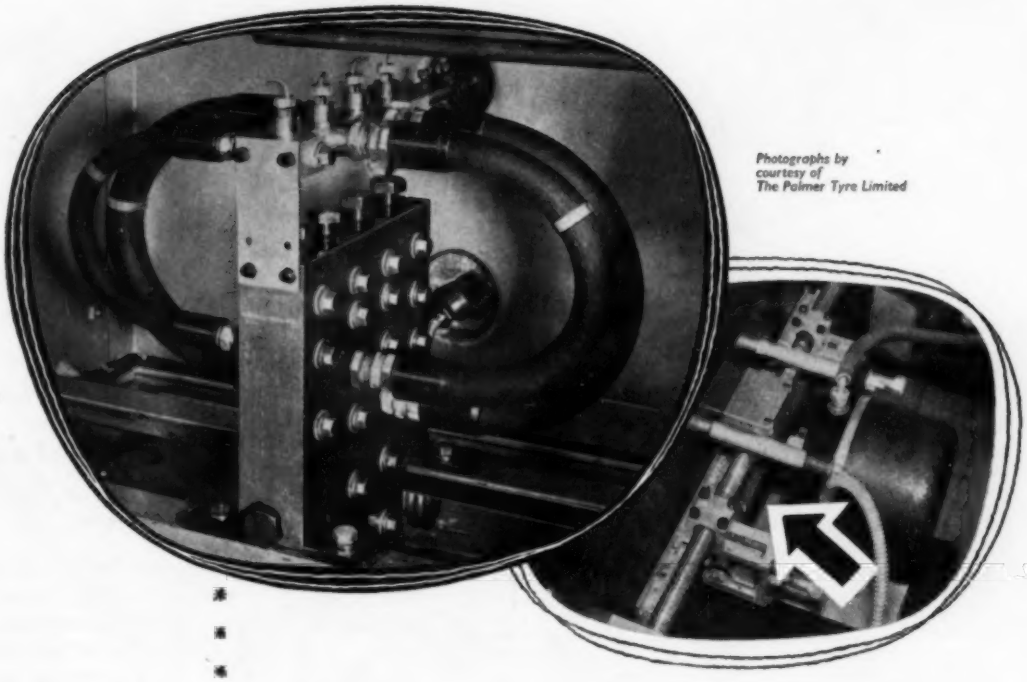

Photographs by courtesy of The Palmer Tyre Limited

New test requirements for vibration endurance are stretching to the limit the performance of conventional mechanical vibration tables.

High frequencies are no problem to the electrodynamic method but this particular test calls for about 28 'g' acceleration and therefore a high force input. This has been achieved using a relatively small vibration generator and a resonant beam (arrowed) to test four flexible pipes simultaneously. The beam which is of tempered gauge plate $12\frac{1}{4}" \times 1\frac{3}{8}" \times \frac{1}{4}"$ helps to balance the inertia of the test rig so that the model 390A vibrator with model D.120 Power Oscillator is adequate to provide the applied force required.

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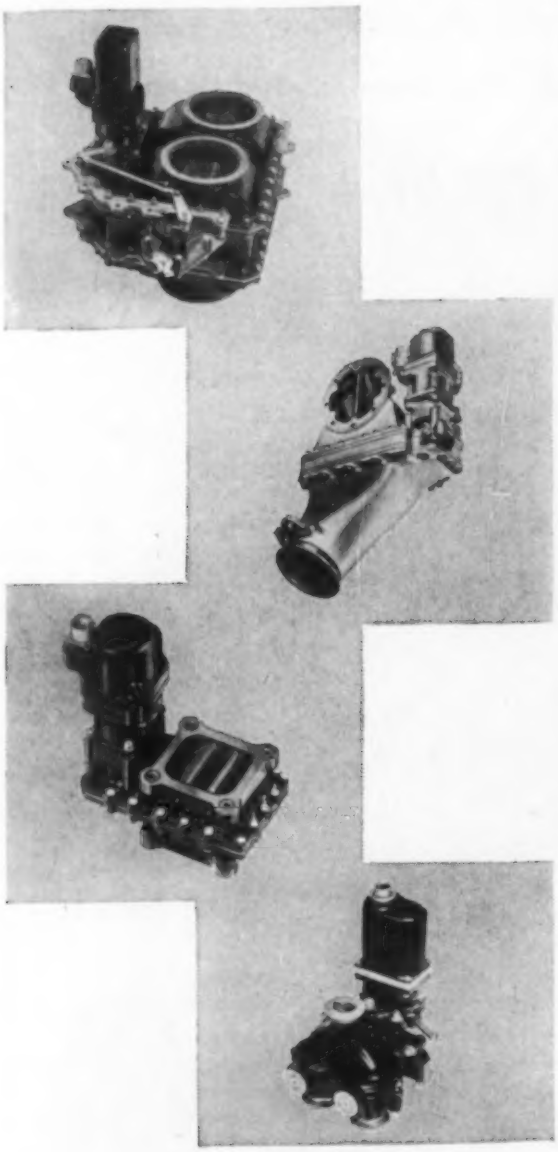

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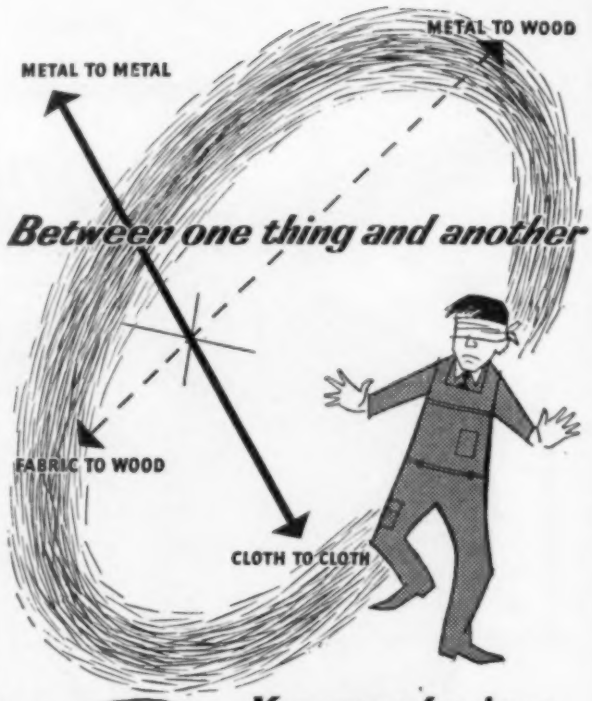

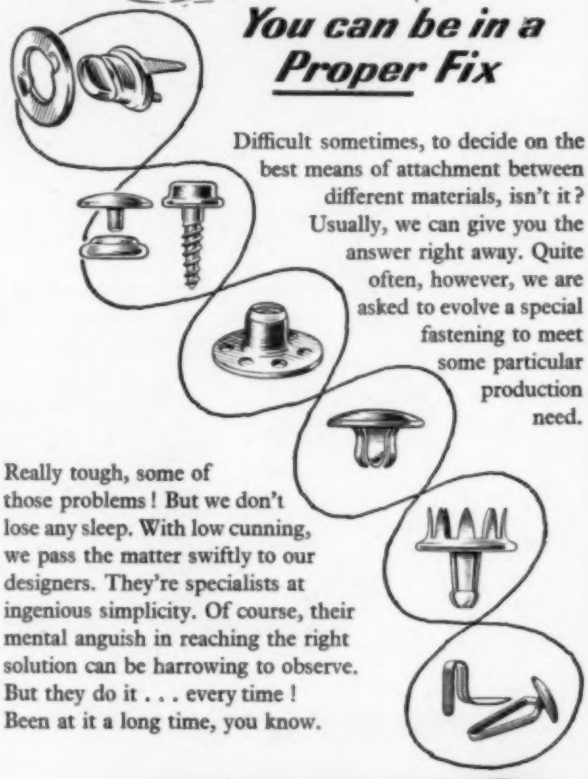

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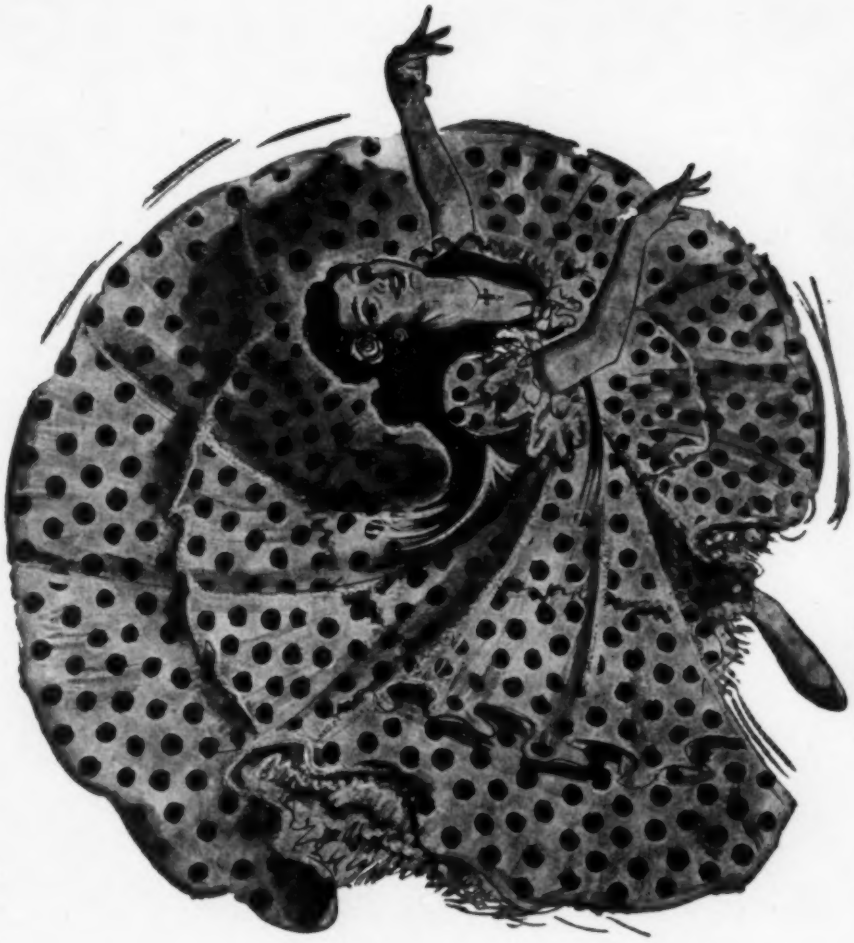

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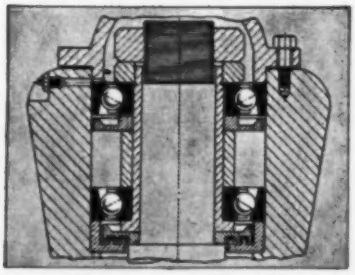

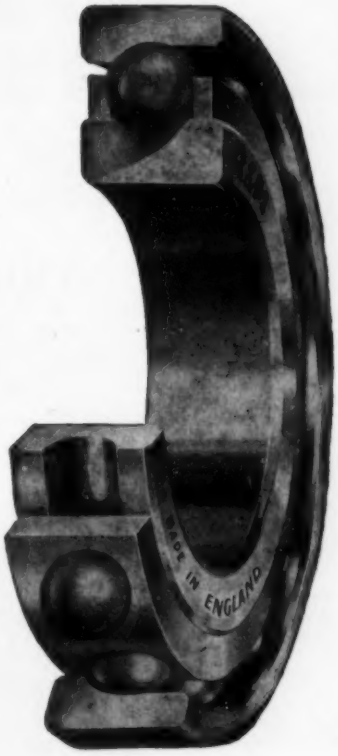

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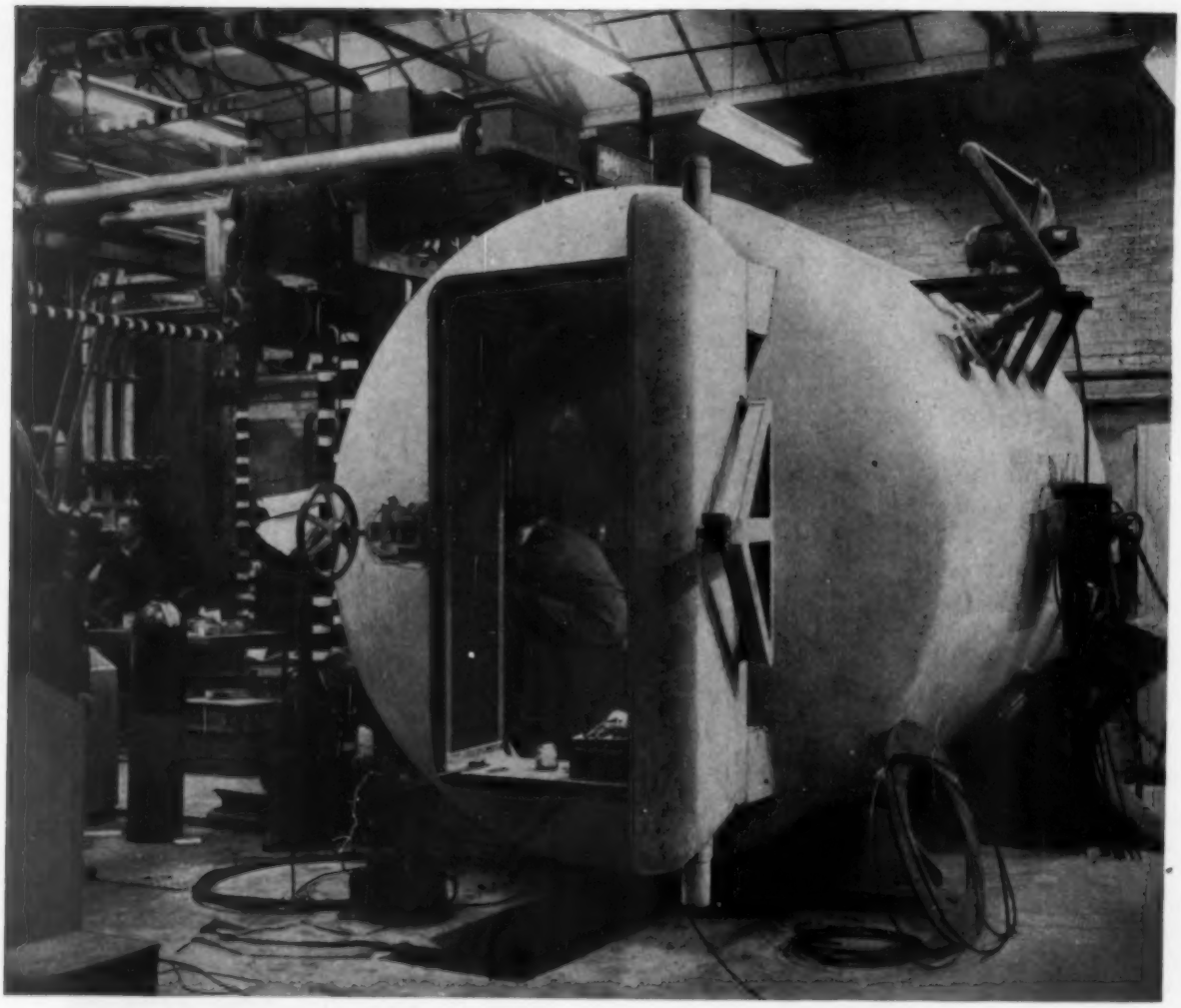

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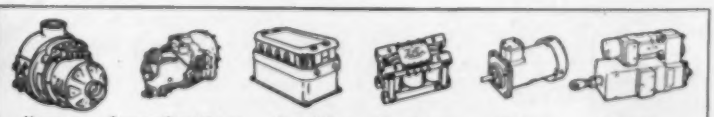

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FLIGHT
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AIRCRAFT ENGINEER

No 2478 Vol 70 FRIDAY 20 JULY 1956

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Diagnosis and Remedy

HAMLET'S wicked uncle Claudius, darkly plotting the disposal of his nephew, observed: "Diseases desperate grown by desperate appliance are relieved, or not at all." Shipping him off to England was, even the most rabid anglophobe will agree, a fairly moderate appliance in the circumstances. That it did not succeed does not alter the fact that too-drastic measures often fail to achieve the desired remedy.

This is especially true of aviation problems. Any remedy for the present economic illness of European air transport must, to succeed, be firm but moderate, and prescribed only on the basis of skilful and thorough diagnosis. The strength of Mr. Stephen Wheatcroft's admirable book (of which we conclude our review on page 133) is that its recommendations—like sound aeroplanes—incorporate proven principles and are founded on painstaking research.

Significantly, the very few Wheatcroft conclusions with which it is difficult to agree—such as his suggestions for joint airports and airline investment planning—are ones that do not appear to be based on careful analysis. But there is no disputing the thoroughness of the author's other analyses, nor the conclusions which may be drawn from them.

These are simply that, although short-haul routes do have fundamental economic disadvantages, these are not as great as is commonly thought; they can be offset by the achievement of higher-intensity traffic-flows, and by the use at higher frequencies of really big-capacity aircraft specially designed for short-haul work. Furthermore, there seems to be scope for the airlines to make, over a period of time, substantial cuts in operating, traffic handling and administrative costs.

The replanning of the European route-network to achieve the higher intensity of operation would, it is proposed, be made by an air transport commission based on the European Civil Aviation Conference. This proposal is sound for two reasons. First, it would be based on an existing organization that works. Second, its success need not depend upon a still-elusive multilateral agreement, or upon the surrender of sovereignty, cabotage rights, and all the other chauvinisms of a "nationalism as complex as seventeenth-century mercantilism."

It would depend for its success on the goodwill of the nations and on their governments' sympathetic understanding of the desired economic objectives. Let their appointed authorities read Mr. Wheatcroft's book.

Pilots of London

ANCIENT and full of tradition though it is, the City of London has never been slow to recognize and encourage what is new and promising. Last week another historic step was taken when livery was granted to the Guild of Air Pilots and Air Navigators, and aviators were thus added to the list of London's professional companies, which became an important element in the constitution of the City as long ago as 1475. The Queen, a past Grand Master of the Guild, is today its Patron and the Duke of Edinburgh its Grand Master.

In the last 150 years only twelve new guilds have been granted livery, making a total of eighty in all. Such a privilege and responsibility is thus not bestowed quickly or lightly. Nor are the guilds antiquarian survivals; except for the deep roots of their traditions and principles they are to be regarded as active bodies, meeting and matching the changed times and conditions as in the past.

The City of London, with its trade founded on merchant shipping, has lately been well aware of the significance and potentialities of air commerce. There is no doubt at all that aviation will become an increasingly important part of the City's business and the life of its people. For itself, aviation needs all the help in meeting its problems of development and expansion that the City can give. Such attention will, without doubt, pay generous dividends in the years to come. Neglect of commercial aviation would be nothing short of disastrous for the nation.

FROM ALL QUARTERS

Not so Incidental

A PROTEST has been made to *Life* magazine by Mr. John Peck, of the British Information Services in New York, about the use of the phrase "incidental air community" in referring to Britain in the magazine's recent "Air Age" issue.

In his letter to *Life*, Mr. Peck says that Britain developed the first jet engine and holds the world speed and altitude records; that the U.S. Navy is using three aircraft carrier aids, the angled deck, the steam catapult and the mirror landing device, which are all British-designed; and that after the last war the U.S. Air Force and Navy used British engines for which U.S. firms bought manufacturing rights.

"Surely a country with such a history of technical achievement hardly deserves to be called an 'incidental air community,'" said Mr. Peck.

The National Air Races

TODAY and tomorrow, July 20 and 21, the National Air Races and British Lockheed Trophy International Aerobatic Competition are being held at Baginton Aerodrome, near Coventry. Preliminary rounds for the Lockheed Trophy are being flown this evening (Friday) from 5.15 to 7.45 p.m., and the final competition between 2.15 and 3.15 tomorrow afternoon. Third rounds of the S.B.A.C. and Osram Cup and the Kemsley and Goodyear Trophy races will be held tomorrow morning (Saturday) between 10.30 and 12.30, and the King's Cup Air Race in the afternoon from 3.57 to 4.47 p.m.

Today the gates will be opened to the public at 1.30 p.m. and admission prices will be:— Public enclosure: adults 1s, children (under 15) 6d; reserved seats: adults 2s, children (under 15) 1s; parking: cars 1s, motor cycles 6d. Tomorrow (Saturday) gates will be open at 9.30 a.m. and the charges will be:—Public enclosure: adults 2s 6d, children 1s; reserved seats: adults 5s, children 2s 6d; parking: cars 2s 6d, motor cycle combinations 1s 6d, motor cycles 1s, coaches (in separate park) 10s. Catering facilities will be available. Enquiries for tickets or further information should be made to Mr. Harry Slade at The Council House, Coventry, Warwicks.

In addition to the races there will be a comprehensive flying display tomorrow afternoon, which is scheduled to include aerobatic displays by the U.S.A.F. Skyblazers, the French Air Force Patrouille de France and R.A.F. Hunters, glider and parachute demonstrations and a R.N. helicopter in a bicycle act. The programme ends with the prize-giving at 6.25 p.m. From 2.30 p.m. to 7.45 p.m. today, and from 10 o'clock to 12.45 p.m. and two o'clock to 6.10 p.m. on Saturday, Baginton will be closed to visiting aircraft.

Two Argentine entrants for the Lockheed Trophy, Senor Santiago Germano and Senorita Charito Maneyro Segado (the only woman pilot entered), recently sought political asylum in Uruguay and are reported as saying they are unlikely to be able to compete at Baginton this year. It was Senorita Segado who in 1951 did 963 consecutive loops to claim the world looping record. Up to the time of going to press, however, the Royal Aero Club had not received any formal notification of withdrawal from the two Argentinians.

Entry lists for the third round of the races are as follows:—

S.B.A.C. Cup.—J. N. Somers (Somers-Kendall S.K.1), F. Dunkerley (Sparrowjet), R. R. Paine (Hawk Speed Six), S/L. J. Rush (Falcon-Six), G. C. Marler (Falcon-Six), A. S. K. Paine (Proctor 1), E. Crabtree (Proctor 3), W/C. R. H. McIntosh (Proctor 3). **Reserve:** P. Clifford (Mew Gull).

Osram Cup.—P. Blamire (Gemini 1a), E. Crabtree (Gemini 3), T. G. Knox (Proctor 3), E. N. Husbands (Proctor 3), A. Barker (Proctor 3), J. N. Somers (Chipmunk), J. R. Johnston (Hawk Trainer 3), J. E. G. Appleyard (Chilton D.W.1a).

Kemsley Trophy.—A. J. Spiller (Messenger 2a), C. Gregory (Taylorcraft Plus D), W. P. Bowles (Monarch), J. H. Denyer (Auster J.IN), J. M. Donald (Tiger Moth), B. J. Snook (Tiger Moth), S/L. D. P. Boulnois (Tiger Moth), J. G. Lovegrove (Tiger Moth).

Goodyear Trophy.—Miss A. Windle (Whitney Straight), H. B. Iles (Miles M.18/2), B. Maile (Tiger Moth), D. F. Ogilvy (Comper Swift), Hon. P. Vanneck (Tiger Moth), N. D. Norman (Tiger Moth), A. G. Oldham (Tiger Moth), N. H. Jones (Tiger Moth).

BAGINTON CIRCUITS for the National Air Races (short course) and King's Cup Race. The S.B.A.C. and Osram Cup contests are over four laps, the Kemsley and Goodyear Trophies over three laps, and the King's Cup over four 17-mile laps.

Canberras for India

FROM New Delhi comes a report that India has finally decided to place orders for a number of Canberras. Mr. M. K. Vellodi, Secretary of the Ministry of Defence, is likely to return home soon from England, where he is engaged in discussions concerning this important order.

An English Electric spokesman said that the final stage of negotiations was now in progress and that the number of aircraft involved would probably be "around 60." These are likely to be of the versatile Mk 8 pattern.

AERIAL FARMYARD: Three North-American F-100 Super Sabres are refuelled simultaneously by the probe-and-drogue method from a single Boeing KB-50 tanker in a test near Eglin Air Force Base, Florida.

VISITING EUROPE recently was Mr. Edmund T. Price, chairman of the Solar Aircraft Company of San Diego (left). He is being greeted here by Mr. Patrick Johnson, European manager of Solar.

PEACE AND WAR were typified at the Royal Aeronautical Society garden party (reported on this page) by—above—the Edgar Percival P.9 agricultural aircraft and (right) Supermarine's Spitfire and Hawker's Hurricane. The "Spit." and "Hurribus" engaged in a vigorous mock combat as our picture shows. (More pictures on page 134.)
"Flight" photographs

No Thin-Winged Javelin

NO Government order will, after all, be forthcoming for a thin-winged version of the Gloster Javelin. This variant would have had a performance very much more advanced than that of the standard Javelin—a maximum speed in the region of 1,000 m.p.h.—and would have been powered by two Bristol Olympus engines.

Because the order has not been placed, Glosters report, between 60 and 80 workers in their tool-room have become redundant, but it is hoped that they can be absorbed into other sections of the factory.

The Javelin FAW.1 is already in service with No. 46 Sqn. at Odiham. Two more squadrons of FAW.2s and FAW.4s are to go into service by the end of the year.

Meteor-trail Communications

IT is reported from Ottawa that messages have been transmitted at an altitude of a thousand miles along the trails of meteors by a method developed by Canadian research. The existence of the system (code-named "Janet") was revealed in Ottawa recently by the Canadian Minister of Defence, Mr. Ralph Campney, who said that Britain and the U.S. have encouraged the Canadian effort.

The system, by which meteor trails can be used for communicating between distant points on the earth's surface, uses tiny particles about the size of a pin-head, which leave trails of electrons, and it employs frequencies previously used only for short distance transmissions. The first two-way transmission using the new method took place between Shirley Bay and Port Arthur, Ontario, in 1953.

Russia's Flying Boxcar

BEARING the Soviet designation Yak-24, known popularly as the Flying Boxcar or Flying Van, and listed in the Allied nomenclature code as "Horse," is a Soviet helicopter of outstanding merit. A measure of its quality was the acquisition this year of two world records. Taking off from Tushino, G. A. Tinyakov took a load of two metric tons to a height of 5,082 metres, and E. F. Milyutichev ascended to over 2,000 metres with four tons. In the recent Tushino display four Yak-24s and thirty-six Mi-4s demonstrated mass landing under difficult circumstances. Between them they unloaded 22 lorries, which towed twelve field guns and four multiple anti-aircraft guns. One hundred and seventy five soldiers were disembarked.

The following brief description is from a Polish source:

"Flying Boxcar" was designed in 1954 and is of tandem twin-rotor configuration. The four-blade rotors closely resemble those of the Mi-4 helicopter. Counter-rotation of the rotors balances out the torque-reaction. There is one engine for each rotor and the respective gearboxes are coupled together by a shaft which provides for continued flight in the event of an engine failure. The fuselage, of characteristic boxcar shape, is a frame-structure, its forward and rear sections being metal-skinned and the middle portion being fabric-covered.

In the crew-compartment are seats for the two pilots and radio operator; the forward engine bay is immediately to the rear of the crew compartment and is accessible during flight. A narrow passage leads through to the main cabin, which can accommodate three cars of the M-20 *Pobeda* type. Unobstructed entry for bulky loads is provided by a loading ramp which can be lowered from the rear end of the fuselage. Towards the tail the fuselage slants upwards and narrows into a fin, on top of which is mounted the tail rotor. At the base of the fin structure cooling-air inlets are situated and the fin itself ends in a vertical trimming tab. To increase the stability, during transition from the hovering to horizontal flight, a butterfly-type tailplane is fitted, braced with struts on both sides of the fin.

ST. SWITHIN'S DAY AT WISLEY

THERE fell upon St. Swithin's Day (being Sunday, July 15) at the aerodrome of Wisley, in the parish of Ockham, Surrey, a most pleasant Garden Party of the Royal Aeronautical Society. It was leisurely in pace, and—but for the single fierce interlude of battle we shall describe—restful to the ear.

The first challenging roar of conflict came as Jeffrey Quill started up a Merlin 55M in a Spitfire of uncommon aspect. Had it worn a badge, this must surely have displayed the bar sinister, though the tasteful-as-ever programme decently described the machine as "something of a hybrid." (To present the unvarnished truth, the airframe is that of a Spitfire VB, and the engine—boosted for low-level output and driving a four-bladed airscrew—served with the Navy in a Seafire III.)

Take-off was far briefer than was ever accomplished by any related—legitimate—contemporary, and as Quill pulled the camouflaged fighter round the grey sky and green landscape, it was seen that he himself had lost none of his now-legendary skill. Scarcely had he succeeded in rectifying the handicap of a half-retracted starboard undercarriage when Hawker's blue-and-gold Hurricane, Bill Bedford up, intruded upon the scene. The Hurricane's Merlin 20 sang derision at the Spitfire's war-dance, and battle was instantly and closely joined. Many a doughty deed of fighter-pilotage was witnessed, the racking turns as the two pilots jockeyed for position having the stamp of grim earnest. We have Quill's assurance, indeed, that this memorable joust was quite unrehearsed.

Gloster's pet Gladiator G-AMRK (Peter Varley) and Fairey's Fulmar G-AIBE (G/C. Gordon Slade) gave distinctly individual demonstrations. A débutante at the party was the Edgar Percival P.9, attractive in its fresh paint and in all aspects of its performance, especially at take-off and landing. The genial "E.P." was naturally in charge. Spruce and spritely was the newly delivered Miles Aries of Mr. L. R. Snook (see page 110).

In four Magisters Messrs. Ogilvy, Vernon and Bailey and Miss A. Windle threw down a challenge to the Fighting Cocks and Skyblazers—in respect of station-keeping at least—and Mr. C. Nepean Bishop's Tiger Moth aerobatics bore his personal stamp. Contributing in greater or lesser measure—and there was some notably polished flying—were the Fairey Swordfish (R. Morris); Hawker Cygnet (Frank Murphy); D.H. Moth (C. A. Pike); D.H. Chipmunk (D. R. Bevis); Whitney Straight (Miss Windle); Percival Mew Gull (P. S. Clifford); Fairey Tipsy B (John Dennis); Fairey Tipsy Belfair (Peder Andersen); Fairey Junior (John Moreton); Beechcraft Bonanza (S. Lewis); D.H. Moth Minor Coupe (C. H. Croxson); and D.H. Dove flying classroom (W/C. C. G. B. McClure). Static veterans were the Bleriot XXVII, Caudron G.III, Maurice Farman, Avro 504K, Sopwith Camel, Fokker D.VII and S.E.5A. Vickers showed Wellington 10, number MF628—the last of 11,461 Wimpeys built and which they have presented to the Society for its vintage collection. Curiously, this self-same Wellington turned up at the 1953 "Fifty Years of Aviation" Garden Party at Hatfield.

Something out of the ordinary was the replica of the Wright Brothers' engine, constructed by apprentices of the de Havilland Aeronautical Technical School. Some visitors were lucky enough to see it running—on various combinations of cylinders.

Among some 4,500 guests, of whom 30 came in by air, was Mr. Harold Watkinson, Minister of Transport and Civil Aviation.

ALL QUARTERS . . .

Mixed-Power Hustler

IT it now known that the Convair B-58 Hustler supersonic bomber will have permanently installed liquid-propellant rocket motors in addition to its curiously disposed quartet of General Electric J79 variable-geometry turbojets. The rockets, which will be made by Bell Aircraft, will be used for take-off and during periods of operational emergency.

In our Aero Engines issue on May 11 we commented on Bell's achievement in developing rocket motors with light-alloy combustion chambers. Such a form of construction will be employed on the B-58 motor, which is reported to be very similar to that offered by Bell for propulsion of the second stage of the Vanguard earth-satellite.

Marking Moby Dick

AN account of the first marking of whales from a helicopter has been given by Robert Clarke, of The National Institute of Oceanography, in *The Norwegian Whaling Gazette*. It was undertaken by a Portuguese machine south of Terceira, in the Azores, in order to gather material for whale population statistics.

Two flights were made, due south from the town of Cisf Angra do Heroismo. On the first, a school of six sperm whales and a calf was sighted; on the second, four sperms and a calf.

The helicopter approached the school at 15ft and although it was only 45-90ft from the whales, they appeared unconcerned. However, when it hovered almost vertically above two bulls together, they became violent and suddenly submerged.

Marking was carried out by small arrows up to 18in long with plastic tags, shot by a little harpoon gun into the thick layer of blubber immediately under the hide of the whales. On the two flights, two hits and a possible hit were scored. According to records at the International Whaling Institute at Sandefjord, Norway, none of the marked whales has yet been caught.

R.P.S. Exhibition

AN exhibition of two-fold interest is now being held by the Royal Photographic Society. It comprises *The Beauty of Sail*, by Frank Beken and Keith Beken, and *Air-to-Air Photography*, by Charles E. Brown. These three photographers are of international fame and many of the air-to-air pictures on show have appeared from time to time in the pages of this journal.

Capt. J. C. Harrington on arrival at the Mansion House on the occasion of the granting of livery to the Guild of Air Pilots and Air Navigators (see opposite page).

The exhibition was opened, appropriately, by Lord Brabazon —a great sailing man, the first Englishman to fly a circular mile (*Flight* has a photograph of him doing it), and a pioneer in aerial photography. He is an honorary fellow of the R.P.S.

In his opening address, Lord Brabazon spoke of the differences and similarities of the exhibitors' work—in the Bekens' case, to transform "some rag and wood" into a living thing of great beauty, and in Charles Brown's case to portray unchanging aircraft by means of superb backgrounds.

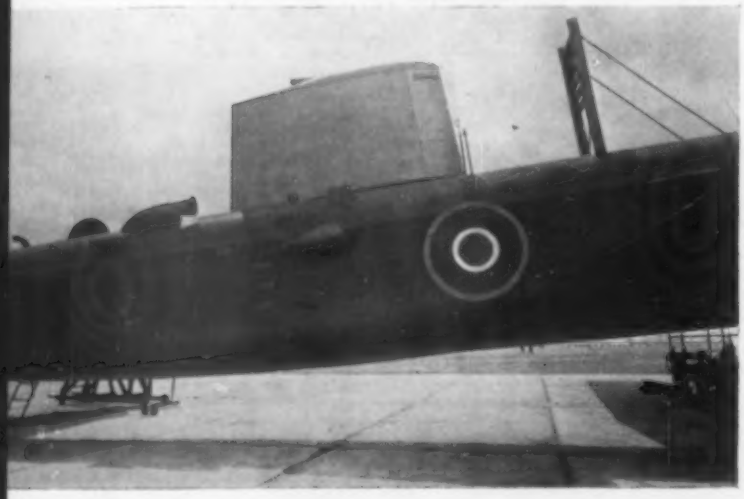
The exhibition, which is staged in the Society's headquarters at 16 Palace Gate, Kensington, will remain open until July 28.

DE-ICING TEST BED

OWING to their considerable background knowledge of de-icing development as a result of their evolution and manufacture of the Spraymat system, D. Napier and Son, Ltd., have been entrusted with the task of evaluating the ice-protection system employed on the Blackburn Beverley. For this purpose the company's Flight Development Establishment at Luton have modified an Avro Lincoln into what is probably the most versatile "ice waggon" yet developed in Britain. In its essentials the aircraft is reminiscent of the familiar DC-4M-2 "Rockliffe Ice Wagon" of the R.C.A.F.

A test section of Beverley wing has been mounted vertically above the Lincoln fuselage, pivoted on a vertical axis to move through an angle-of-attack range from $-1\frac{1}{2}$ to $+10\frac{1}{2}$ deg. By varying this angle and the airspeed the Lincoln will be able to simulate various operating conditions of the wing on the Beverley. Hot air for the Beverley leading edge is provided by a Lucas $2\frac{1}{2}$-therm heater installed in the rear fuselage of the Lincoln, supplied from a tank in the bomb bay. Air for circulation and combustion enters through the large intake visible in the photograph. Combustion gases are exhausted at the rear of the fuselage and the circulating flow from the heater varies from 1 to 1.5 lb/sec. This is considerably more than is required by the short test section, which can be maintained at any temperature up to 200 deg C by dumping most of the hot air overboard and mixing the anti-icing air with fresh cold air before passing it through a flexible coupling to the main supply duct within the test wing. From this duct the hot air passes forward to the leading edge and back through chordwise corrugations in which minute pitot and static tubes are installed to measure the flow.

Approximately 6ft ahead of the test leading edge are 36 nozzles supplied with water from two 60-gallon bomb-bay tanks pressurized to 50 lb/sq in. A two-stage supercharger on the port outer Merlin engine feeds compressed air to the water spray nozzles to obtain the necessary atomization between 20 microns droplet size (for continuous maximum conditions) and 30 microns (for intermittent maximum). Instrumentation is as complete as one would expect. Provision is made for two flight observers (whose stations are heated by Napier Spraymat panels) and virtually every variable concerned with the de-icing of the test section can be precisely measured, observed and photographed. In addition to the comprehensive record obtained from automatic-observer films, droplet samplers are provided with a special camera/microscope for recording the droplets picked up on each slide during flight.



Napier's Luton establishment performs many special conversions for the Ministry of Supply. As noted in the text, this Lincoln has been equipped as a test bed for icing problems. The Beverley test wing is obvious; also visible are (left to right): heater intake, camera fairing, sampler probes (ahead of the wing) and spray mast.

The Duke of Edinburgh receives the Letters Patent from the Lord Mayor, Sir Cuthbert Ackroyd.

THE GUILD HONOURED

Grant of City Livery

IT was a proud occasion on July 11 for the Guild of Air Pilots and Air Navigators, for that day saw the handing-over to their Grand Master, the Duke of Edinburgh, of letters patent confirming the grant of livery to the Guild. This took place at a short but impressive ceremony in the Long Parlour of the Mansion House, London.

When the Duke of Edinburgh had robed in the Venetian Room, a procession formed led by the City Marshal, who was followed by the Master, Wardens and Clerk of the Guild, then the Town Clerk and the two senior Aldermen. Next came the sword bearer and mace bearer, immediately preceding the Lord Mayor and the Duke of Edinburgh.

When everyone was assembled the Town Clerk announced the occasion of the meeting and the order of the Court, and a speech by the Lord Mayor, Sir Cuthbert Lowell Ackroyd, followed, in which he said:

"May it please Your Royal Highness:

"On September 29 last year I was elected by the liverymen of this City to be Lord Mayor for the year ensuing. There were gathered together in Guildhall on that occasion Mercers and Goldsmiths, Carpenters and Cordwainers, Drapers and Clothworkers, Master Mariners and Shipwrights, in fact the liverymen of all the eighty guilds that have achieved the right to be livery companies of the City of London. . . .

"A Charter granted by Edward III in 1341 enables the City to make orders for things new arising, providing such orders are for the common profit of the citizens and consonant with good faith and reason. Thus the City must feel certain that things new are for the common good before it gives its blessing. So naturally it has not lightly extended the privilege of livery to new organizations, only 12 guilds having been granted a livery in the last 150 years.

"Nevertheless, when a trade, profession or occupation not previously represented among City Companies has sought recognition and has demonstrated beyond doubt that it has the welfare of the City and the citizens at heart and is willing to honour the custom of London, then the City has always been ready to amend the franchise accordingly. The City has never considered the livery companies to be antiquarian survivals, but living institutions capable of development.

"To-day we welcome the Guild of Air Pilots and Air Navigators to the rank of a Livery Company, even as our predecessors welcomed the Coachmakers in the less hurried days of 1687. In civic history the Air Pilots have been swift, as becomes their profession, to achieve the status of a livery company. The City is well aware that it owes much of its status and prosperity to the fact that it was a natural centre for trade and commerce by land and sea. Its future prosperity will rest more and more on efficient communication by air. This grant of livery demonstrates that the Guild values deep roots of proven stability and that the City, as always, is pleased to foster enterprise, invention and technical skill. Mr. Chamberlain, however, may be faced with a problem when there appears at Guildhall for admission to the freedom—an automatic pilot!

"We are confident that the Livery Companies of London will be strengthened by the accession of your Guild, and that you, the good men of the Guild of Air Pilots, will do all in your power to raise the standard of knowledge, practical proficiency and professional conduct in accordance with your objects.

"Can I say how much the Guild of Air Pilots is honoured by having as the first Master of the Livery His Royal Highness the Duke of Edinburgh? I am delighted to welcome His Royal Highness here today as your Grand Master."

The Lord Mayor then handed the grant of livery to the Grand Master. Extracts from the letters patent read as follows:

"To All and Singular that shall hear or see these presents We Cuthbert Lowell Ackroyd Esquire, Lord Mayor and the Aldermen of the City of London send Greeting.

"Be it known that on the sixteenth day of November in the third year of the Reign of our Sovereign Lady Queen Elizabeth the Second a Petition of the good men of the Guild of Air Pilots and Air Navigators of the British Empire was read in the Court of Mayor and Aldermen before Harold Walter Seymour Howard Equire Lord Mayor and the Aldermen in the Inner Chamber of the Guildhall praying that the said Lord Mayor and Aldermen might constitute them a Livery Company of the City of London in such manner as to the Lord Mayor and Aldermen might seem fitting. . . . the Lord Mayor and Aldermen on the tenth day of April in the year aforesaid did grant confirm and ratify unto the good men of the Guild of Air Pilots and Air Navigators of London that they be a Company of the City of London and enjoy a Livery subject to the limitations aforesaid that the Chamberlain of London admit their freemen to the Freedom of the City and enrol their apprentices in accordance with the custom of London . . .

Accepting the letters patent, the Duke of Edinburgh said:

"My Lord Mayor and gentlemen, allow me, on behalf of the Master and Wardens and all the members of the Guild of Air Pilots, to express our very deep and sincere thanks to you and to the City authorities for this great privilege. The Guild as a whole is fully aware that this is, to say the least, an unusual occurrence, and I am sure they would all like me to say how very much they appreciate this honour and to thank you personally for the amount of trouble which you have taken in this subject. It is very true that the profession of pilot is young, but you will notice, gentlemen, that the Guild includes navigators—and that, if you'll remember, is one of the oldest professions known to man, but not before in the air.

"You will notice that these two—the pilot and the navigator—are responsible between them for the safe and regular passage of great numbers of aircraft, millions of passengers and immense quantities of freight all over the world, at all times of the year. It is true also that the profession of flying is young, but in a relatively short time, in more ways than one, it has made a very considerable impact, of which the City should not be unaware. . . . in the Services it is already assuming almost a dominant partnership, and in the world's civil life has literally made all men neighbours.

"In granting this Livery to the Guild, the City, for all its ancient institutions, has shown, once again, that it is well aware of modern development, and I think it also recognizes that the air is a new medium of transport and a new means of commerce of the utmost importance to this great centre of commercial enterprise. For its part the Guild will always, my Lord Mayor, attempt to show that everybody engaged in the air transport industry will constantly try to perform its duties efficiently, and to be active and helpful partners to the business interests of the City and for the welfare of the nation as a whole.

"My Lord Mayor, we undertake not to introduce 'George' or any of his mechanical navigator assistants until the Lord Mayor of London himself is a robed robot."

Following the ceremony, luncheon was held, by permission of the Lord Mayor, in the Mansion House. Captain J. C. Harrington, Master of the Guild of Air Pilots and Navigators of London, proposed the toast of the Lord Mayor and the Corporation of London. He thanked the Lord Mayor and Aldermen on behalf of all the members of the Guild for the very great honour bestowed upon them by the City that day.

The history of flying had been one of courage gaining ascendency over adversity; of hitherto unbelievable achievements being attained. "As you well know, my Lord Mayor," the Master said, "we have reached the position today when man travels faster than sound and flights to other planets might even be attempted during our lifetime."

The Master then mentioned briefly the group of enthusiastic and discerning pilots and navigators who, in 1929, met at a London restaurant with the intention of ensuring that the dignity and status of a pilot's calling should be jealously guarded and maintained. That meeting marked the birth of the Guild.

In conclusion the Master said: "We are very conscious that compared with other City guilds we have little to offer in experience but we are proud of our profession and the distinguished part it has played during its relatively short lifetime."

The Lord Mayor replied with congratulations and good wishes and a pertinent reference to technical education. He concluded with the time-honoured City toast: "May it (the Guild) prosper root and branch and flourish for ever."

HERE AND THERE

POZNAN FAIR was the occasion of the unveiling of Poland's Bies TS-8 all-metal trainer. Designated WN-3, the engine is rated at 320 h.p. Weight is 3,400 lb.

Republic Missiles

PLANS are in hand to double the facilities available to the guided missiles division of the Republic Aviation Corporation. During the current month the division is moving from the original plant at Hicksville (Long Island) to a new building at Mineola. Two of the major responsibilities of the division are an air-to-air missile system and an air-to-surface fire-control system. The division is also in production with a low-cost bombing trainer for the U.S. Navy comprising an under-wing "pod" filled with practice bombs and electronic equipment. A similar unit is being developed for the U.S. Air Force.

New U.S. Bomber Base

OPENING a bomber base at Portsmouth, New Hampshire, on June 30, the U.S. Air Force Secretary, Mr. Donald Quarles, said that next year 150 strategic aircraft—including a hundred B-47s—would be operating from it. The base has cost 70 million dollars (£25 millions).

Canadian Sabre Gift

THE Canadian Government is giving 75 new Sabres to the German Federal Republic to assist in equipping its Air Force. The value of the gift, including a supply of spare parts, amounts to about £12,500,000 and it is being made under the Canadian mutual aid programme.

M. o. S. Appointment

THE Ministry of Supply has announced the appointment of Mr. E. W. Chivers as principal superintendent of the electronics division of the Armament Research and Development Establishment at Fort Halstead, Sevenoaks, Kent. He will take up this appointment in September.

More Red Reactors

PEKING radio has amplified the bald announcement (*Flight*, July 6) that the Soviet Union is developing an atomic-powered aircraft. It is stated that the design speed is "about 600 m.p.h." and that about 2½ oz of atomic fuel would be consumed in a flight from Moscow to Vladivostock, about 4,000 miles. Significantly, Peking claimed that a Russian research machine has already flown with a reactor on board—almost certainly not used for propulsion.

All Mod. Cons.

FROM Toronto comes the welcome news that the beautiful sectioned display model of the Orenda turbojet has been still further modified this year to bring it up to Orenda 14 standard. This is the latest version of the engine, and it is used in the Canadair Sabre 6 fighter. The new exhibition engine will be displayed on the Hawker Siddeley stand at the forthcoming S.B.A.C. exhibition. Over 3,000 Orenda turbojets have now been delivered, mostly for installation in Sabres and CF-100s.

Models on Show

THE aircraft section at this year's "Model Engineer" Exhibition, to be held at the New Horticultural Hall, Westminster, S.W.1, from August 22 to September 1, has twelve classes and an additional award is being made "for the best model incorporating a battery."

Hunting Percival Change

IT is announced that Mr. L. G. Frise, technical director and chief engineer of Hunting Percival Aircraft, Ltd., has left the company and that Mr. F. H. Pollicutt, chief designer, will henceforth be in control of all the design departments.

Il-14 for Tito

BELGRADE radio reported that on July 10, at the Batajnica airfield near Belgrade, an Il-14 equipped for V.I.P. duties was ceremonially handed over to Marshal Tito as a gift from the Soviet Government.

Seighford Re-opening

THE disused war-time bomber base at Seighford, near Stafford, is to be re-opened, for test-flying, by Boulton Paul Aircraft, Ltd.

Pakistan Air Bases

AN expenditure of 30 million dollars (£10,714,230) by the United States on military construction in Pakistan will include the improvement and expansion of three major air bases, it has been announced from Karachi.

St. Clement's Appeal

THE R.A.F. appeal for St. Clement's Danes church has received £500 from the Dunlop Rubber Company.

New Ford Contract

A CONTRACT for £67m has been awarded by the U.S. Air Force to the aircraft engine division of the Ford motor company for the supply of Pratt and Whitney J57s. The company says that this new contract means that £357m worth of J57s have now been either ordered or delivered.

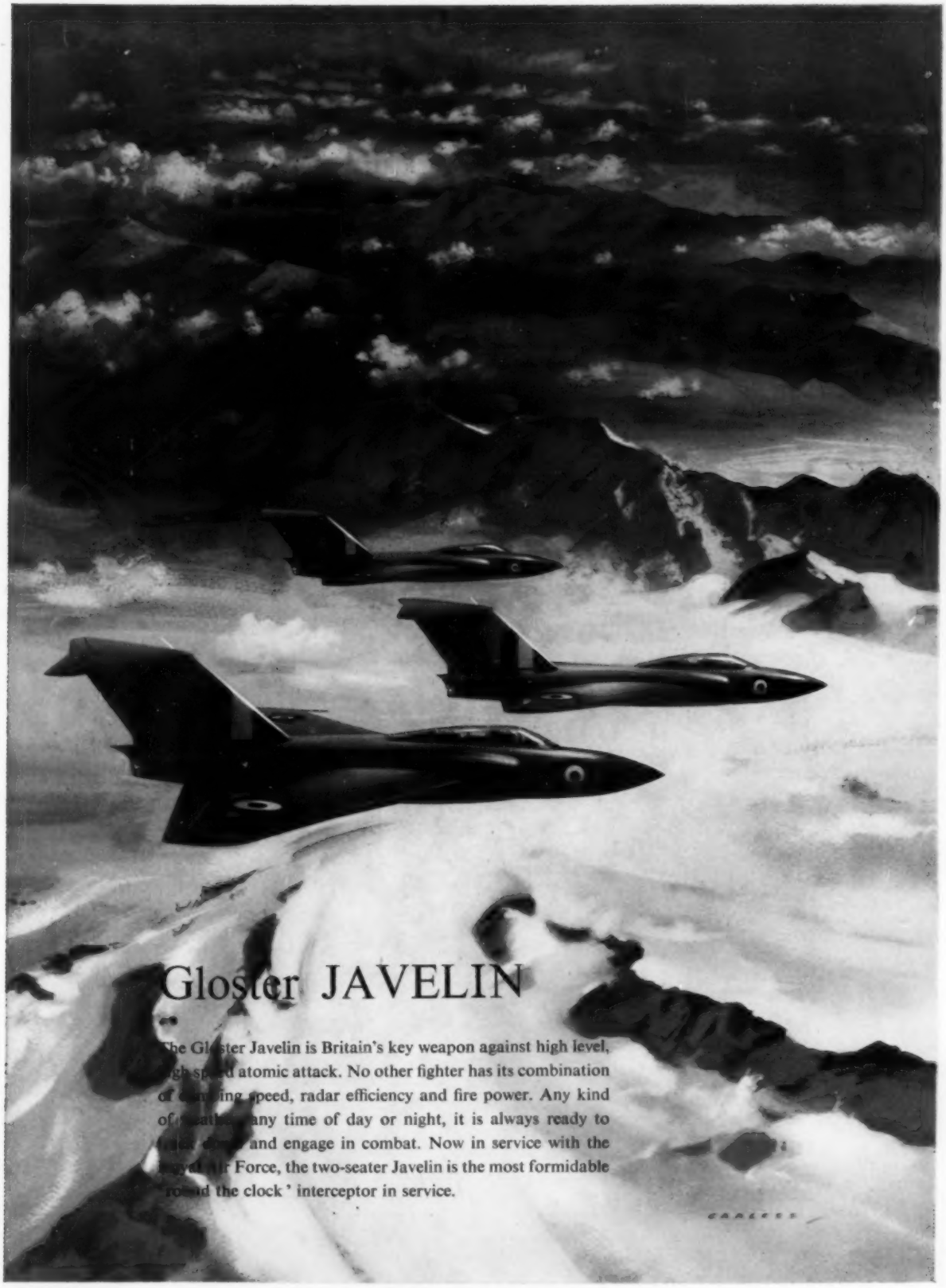
Good Show, Chaps

TWO R.A.F. officers, F/L. S. Kehoe and F/O. R. H. G. Kitcatt, successfully provided the G.C.I. control which enabled the F-86Ds of the U.S.A.F.'s 406th Fighter Intercepter Squadron from Manston, Kent, to win the air-to-air rocket/gunnery competition in Tripoli recently. The winning team will compete in the U.S.A.F. finals at Yuma, Arizona, next October.

The Jupiter Missile

IT is announced from New York that the Chrysler Corporation has been awarded a contract for engineering and production work on a new intermediate-range guided missile called Jupiter, which is being developed at Redstone Arsenal, Alabama. Jupiter will have a range in the neighbourhood of 1,500 miles. It is a surface-to-surface missile, described as an 'artillery-type' weapon, and is an improved version of the Redstone. The range of the Redstone is still secret, but it is known to be less than that of the Jupiter.

NEW MILES FOR OLD: Mr. L. R. Snook, of Southsea, Hants (below), taking delivery of his Miles M.65 Mk 8 Aries G-AKFX. Mr. Snook owned G-AKFX when it was a Gemini 1a with Cirrus Minor 2 engines. It has been modified up to Aries standard and fitted with Cirrus Majors of 155 h.p. each in the latest-type cantilever-beam engine mountings with redesigned cowlings.



Gloster JAVELIN

The Gloster Javelin is Britain's key weapon against high level, high speed atomic attack. No other fighter has its combination of climbing speed, radar efficiency and fire power. Any kind of weather, any time of day or night, it is always ready to take off and engage in combat. Now in service with the Royal Air Force, the two-seater Javelin is the most formidable 'round the clock' interceptor in service.

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Lufttransport Union

By FRANK ZIEGLER

An "International" Air Charter Company in Germany

THE terrific urge Germans have to holiday abroad—long repressed by Hitler, the war and post-war economic paralysis—has in the last few years led to a mushroom growth of travel agencies in all West German cities, offering cheap inclusive holidays particularly to Spain and the Spanish islands. This year they were able to advertise widely the added attraction of air travel because, within 12 months of the granting of air sovereignty, several German air charter companies had been formed.

In view of the lack of any confirmation of support by the German government, the risks of charter business in general and the complete inexperience of both agencies and charter companies in this particular field, it is somewhat remarkable that financial backing for these companies was found. Add the difficulty, experienced even by Lufthansa, of finding suitable German pilots and engineers capable of coping with modern piston aircraft, and it is hardly surprising that at least one company has already died in infancy.

Running a charter company in Germany has other drawbacks. First, there is at present no business *other than* inclusive holidays. Second, all aircraft have to be imported, which, with a four per cent tax on capital value, is equivalent to a duty of £1,000 each (plus an import duty on spares varying from four per cent to 30 per cent). Third, there is an obligatory "seat," or passenger, insurance (not payable in Britain or most other countries) amounting to an annual premium of £1,000 per aircraft. Fourth is the German four per cent turnover tax; fifth the cost of sending aircraft to Britain for maintenance; and sixth the present need to employ a number of foreign pilots, who, in the case of British personnel, cost £900 more than they do at home.

Apart from one or two Dakotas and Ansons, all the aircraft in present use are Vikings, recently sold as surplus by B.E.A. at a price considerably lower than that for Dakotas. No one company in Germany has till now acquired more than three (or in one case possibly four) of them, and the rise of their market value from £25,000 to £34,000 in the few months since purchase indicates the premium at which these aircraft now stand. And there are only three companies which at the moment own as many as three of them. These are the Herfurtner company of Düsseldorf which runs an omnibus service, and contracts its aircraft to the "Dr. Tiggis Tours" agency and their maintenance to Eagles; Flugdienst A.G., Frankfurt, whose maintenance is contracted to Airwork (who are also training its aircrews), and Lufttransport Union G.m.b.H., also of Frankfurt.

Of these Flugdienst is in the strongest financial position, for inasmuch as its capital of DM 3 million (£250,000) is held by the state-owned Lufthansa and Federal Railways, and by the state-subsidized Norddeutsche Lloyd and Hapag Lloyd, it also has the backing of the chains of travel agencies associated with the second and fourth, and ultimately of the German taxpayer. On the other hand it only started operating, officially, on May 1, with the well-known Touropa agency as its first customer. Most experienced, by the criterion of contracts already obtained and hours flown, is Lufttransport Union, which is an example of strictly private—and mostly British—enterprise.

This company was founded in February 1955, with a subscribed capital of £600, by Mr. Bernard Dromgoole and Mr. R. Myhill, to carry on business as brokers and handling agents in Germany for B.K.S. and Transair—Mr. Dromgoole previously having been European manager of the former after obtaining for it the delivery contract for British newspapers (see *Flight* for June 17, 1955). Though Lufttransport Union still carries out these functions as a sideline, last October Mr. Dromgoole had the idea of launching it into air charter service in its own right. German backers were found, and the actual capital invested went up to DM 1½ million (£125,000), of which two-thirds is held by Herr Kurt Conle and his brother, and one-third by Herren Saxenberg and Seibert, partners in the original undertaking. To facilitate the obtaining of an operating licence by making the company 100 per cent German-owned, Dromgoole sold his own share and became general manager, with a German assistant, Peter Lauxen. The latter, as former passenger and freight manager in Düsseldorf for S.A.S. and Swissair, with experience also in Cairo, Beirut and the U.S.A., is probably the most qualified German manager he could have found. Before the aircraft (bought in December) or crews had arrived, contracts were signed in January for a year ahead with no fewer than seven travel agencies, and offices had been opened in Frankfurt, Munich, Düsseldorf and Hamburg.

L.T.U. started operating on March 15. By the end of May it had flown over 1,000 hours, averaged a daily flight to and from Majorca, and also started services to Naples and the Canary Islands. Despite the fact that it was flying from no fewer than

Departure and arrival. Below left, passengers for Majorca board a Viking of L.T.U. at Stuttgart and (right) an L.T.U. Viking comes in to Palma.

L.T.U.'s English manager, Mr. Bernard Dromgoole (left) and their chief pilot, Capt. Roy MacDougall, ex-R.A.F. and B.O.A.C.

LUFTTRANSPORT UNION . . .

five German airports, taking on or dropping off passengers at two of them on each flight, delays due to technical trouble totalled just two hours—a record superior even to that of Lufthansa's local services when they first started.

This achievement has been due partly to good management and good flying but chiefly to swift maintenance, for L.T.U. is the only charter company in Germany that has its own maintenance staff, headed by a fully qualified chief engineer and radio engineer. The "chief," George Fox, who comes from B.E.A. *via* Fields of Croydon, has an experience of nine years on Vikings, and is in fact servicing today the very same aircraft he was in charge of nine years ago. The radio engineer, L. H. Head, ex-R.A.F., ex-British South American and West African Airways, has also been with Ferry Airports, Ltd., and was a radio inspector at London Airport. Besides these, L.T.U. has been fortunate in obtaining the services of a qualified German electrical engineer and nine German mechanics, five of them with some previous experience on Vikings with B.E.A. in Berlin, and able to speak English! With this team it is already carrying out checks I and II, and expects next year to be able to do checks III and IV. This year the latter are being done by B.K.S. Engineering at Southend, and one of the arts of management is so to arrange the flying hours of the three aircraft (the company could use another two) that each becomes due in rotation, without overlapping.

The company's, and especially Mr. Dromgoole's, long association with B.K.S. has conferred another benefit. B.K.S. Engineering having bought up B.E.A.'s entire holding of Viking spares (£500,000 worth), L.T.U. has acquired the general agency for all German-registered aircraft, and already holds £20,000 worth of stock, including two spare power units. This puts the company in a strong position *vis-à-vis* its competitors.

At the time of writing L.T.U. has a flying backbone of five captains qualified to land at 1st and 2nd-class airfields by day and night, and seven first officers, some of whom are still being trained up to this standard. Senior captain, in charge of operations and training, is a Rhodesian, Roy MacDougall, ex-Bomber Command and B.O.A.C. The other captains are Fox, an Englishman (ex-B.K.S. and Eagles); O'Neill, Irish (also from Eagles); Massey, a Canadian with Dakota experience, and von Tettenborn, German (ex-Swissair and former chief pilot of the Dr. Tiggis concern). Another German, Pütter, ex-Luftwaffe and one-time Junkers test pilot (also recently arrived from Swissair) is about to be promoted to captain, and the first officers include an Englishman, an Icelander, a Swiss, a German and a Swiss-German.

Capt. MacDougall runs this international team rather as a wartime international squadron of the R.A.F. (of which he has experience), and the spirit among both air and ground crew is similar. It is significant that among the flying staff no trade unionism exists—a deliberate policy on the part of the chief pilot, who believes that where there are good managerial relations there is no justification for a rival loyalty. Nationalities are never mentioned, and every pilot is a personality, not a cipher. Thus within a week of his arrival, Pütter—who escaped from Russia in 1949 after being sentenced to 15 years for "anti-Communist activity"—disclosed that his Christian name was Dietrich, with the result that he is now called "Marlene" by his British colleagues.

The complication and expense of flying from five internal airports, with the consequent need of positioning crews and sending replacements in the event of illness, is compensated for by the company's policy of concentrating on one external route. Over Europe, and particularly over the Alps, the route is the same for Majorca as it is for the Canary Islands. This not only facilitates the sending of a relief aircraft or spares in case of breakdown, but also enables the crews, through familiarity, to shorten their flying times by choosing the most economical heights and revs, thus cutting out refuelling stops.

On the longest runs, to the Canary Islands or Rhodes—a round trip involving 25 flying hours from Düsseldorf and two overnight stops at Tangier—a flight engineer with spares, a radio operator and a second air hostess are carried. On the "donkey" run to Palma—nine times one week, five the next—two pilots and one air hostess are all that is required, thanks to the installation of modern radio and A.D.F. equipment. There was therefore room for the writer as a supernumerary on one flight. Capt. MacDougall was in charge of the aircraft, Lilo Degelmann, ex-Pan American (she trained the other air hostesses), was in charge of the passengers, and Pütter, literally enjoying his second flight in a Viking, was at the controls. Leaving Frankfurt at 08.10, and calling at Stuttgart, we reached Majorca from there in 4¼ hours, and it was pleasant to see an ex-R.A.F. and an ex-Luftwaffe pilot flying side by side.

The Palma runway, approached through mountains, is 1,500 metres long, but as the first 200 are unusable owing to a wall and orange trees, and a Viking needs 1,200, there is usually just 100 metres to spare, and only category I pilots are eligible to land on it. Pütter won the first of his pair of spurs by setting us down very nicely. He won the second on the return journey over the Alps, where the advantage of employing pilots with Swissair experience became apparent. Cloud base was at 3,500ft, and another aircraft of the same company, flying ten minutes ahead, reported heavy icing at 10,000ft. Pütter, with his local knowledge, obtained permission to fly *below* cloud—i.e., between the mountains instead of over them. Despite this, he estimated we would reach Stuttgart at precisely 18.44—and we did.

A brand-new company of mixed nationality supplying a brand-new market on virgin territory—L.T.U. has measured the risks soberly, aware that success after this first experimental year depends on gaining the lead in experience, and a record of good service and safety. Its policy of distributing the initial contracts over a wide field, though costly, is justified by the experimental nature of the market itself; while its technical achievement, unique among its rivals, of becoming an independent, self-servicing unit, has already, with good planning and good flying, yielded an average earning rate per aircraft of £65 per hour on an estimated basis of 1,500 hours' utilization per annum.

Provided it is allowed to go on competing on equal terms in an open market, its prospects are good.

L.T.U. is the only German charter company to do its own maintenance. Here some of its German mechanics, five of whom have served with B.E.A. in Berlin, work on one of the Vikings.

"FLIGHT" PHOTOGRAPHS

MANY of the photographs reproduced in *Flight*, i.e., those taken by our own photographic staff (as indicated on publication) are subsequently available in the form of high-quality prints. Prices are as follows (dimensions given in inches): 5½ × 3½, 1s 4d (glossy or semi-matt, unmounted), or 2s (toned sepia, unmounted); 6 × 4, 2s 6d or 4s; 8 × 6, 3s 6d or 5s 6d; 10 × 8, 5s or 7s 10d; 12 × 10, 6s or 9s 8d; 15 × 12, 9s 6d or 13s: 20 × 16 (semi-matt only), 13s or 18s.

Also available are a postcard series, totalling over 200, depicting both historic and modern aircraft of the R.F.C., R.N.A.S., R.A.F. and Fleet Air Arm. Complete lists of the series are obtainable on application. Prices are 8d each card, or 7½d each for quantities of a dozen or more. One view only—in most cases a good three-quarter front or side—is available for each aircraft type. Also available as postcards, at the same prices, are reproductions of general-arrangement drawings of some 20 British aircraft that have appeared in our "Aircraft Intelligence" pages.

Aviation Traders, Ltd., have bought 150 Prentices from the Ministry of Supply and are converting them at Southend to four-seat private aircraft. The first machine so treated is now undergoing certification trials for a normal category C. of A. It is finished in ivory and black.

PRENTICES for TOURING

A Civil Conversion by Aviation Traders, Ltd.

A VISIT to bustling Southend Municipal airport recently showed just what can be done to make a military trainer into a useful, cheap and comfortable civil aircraft. *Flight's* representative spent a pleasant 40 minutes flying the first civilian example of the 150-odd Prentices which Aviation Traders, Ltd., are preparing to convert into four-seater club aircraft.

Already, almost the whole batch has been ferried down from High Ercall to Southend and Stansted, and the process of obtaining a full normal C. of A. is under way. The machine flown, G-AOKT, has been inspected and repainted in pleasant civil livery of ivory with black trim and has a three months' permit to fly for test purposes, but is otherwise hardly altered from military standard. A further machine is in the Aviation Traders workshops being extensively modified to the final civil configuration.

Some details of layout still remain to be settled and A.R.B. are asking for several small modifications so that the aircraft shall meet the 1952 B.C.A.Rs. These last require some modifications to the fire-wall arrangement, the provision of a water drain in the lowest part of the fuel system, a method of inspecting the oil tank level and the moving of fuse boxes to a point within reach of the pilot in flight.

Aviation Traders' own alterations are designed to make the Prentice a really capacious and comfortable four-seater. When military equipment and crash pylon are removed there is plenty of room in the rear part of the cabin for a really comfortable two-place bench seat. The port throttle and flap lever quadrant are to be removed, leaving the more convenient central pedestal control; the canopy is being radically altered to include a "swing-up" lid running the whole length of each side of the cabin; the brake trigger on the spade grip of the stick is being altered to allow left-handed operation with the thumb, while simultaneously using the radio transmitting switch, leaving the right hand free to work the central throttle; and the turned-up wing-tips, of doubtful effectiveness, are being replaced by plain tip fairings, accommodating navigation lights. The standard two-stage amber screens, as integrally fitted to the military machine, could be retained if the aircraft were required for instrument training. Normally these are removed, though the tinted canopy panels are retained and prove helpful in eliminating sun-glare.

Major advantages of the Prentice as a civil aircraft are that it is all-metal and can be parked in the open; it has a constant-speed airscrew and a cabin hot air supply; complete engine instruments give really thorough indication of engine behaviour; there is plenty of room for four people or a considerable load with one pilot; the cruising speed, at 105kt, is very useful; the endurance is 2.5 hours and a ventral tank giving an extra hour may be offered. Having been designed as a military basic trainer, the Prentice is easy and docile to fly and visibility from the cockpit is excellent. Take-off, landing and taxying are absolutely straightforward, notwithstanding the fairly high-powered engine. Empty and maximum weights are respectively 3,200 lb and 4,200 lb. The Prentice was never noted for sprightliness of performance during its Service life, but its limousine-like qualities render it a very useful machine for cross-country flying. As a civil aircraft it will not be classed as aerobatic unless a customer specifically requests it.

Among the Prentice spares also taken over by Aviation Traders are a number of engines which would be available for replacement purposes. Methods of preparing engines for civil use are now being worked out. The first completely modified aircraft should be completed in the near future and certification trials can then go ahead. The price of civil Prentices has not yet been finalized, but it is hoped to fix it in the region of £1,000.

Before and after. Some of the ready-to-be-converted Prentices (left) awaiting their "beauty-treatment" and (right) the first partly modified aircraft in its handsome new livery. "Flight" photographs

"Flight" photographs

Flying for its own sake—a vic of varied Derby Aviation training aircraft flown by club instructors over the Elstree hangars. Note that two of the three aircraft carry racing numbers. The aerodrome, which is only 12 miles from Marble Arch, boasts a 1,000 yd tarmac runway.

PROFIT AND PLEASURE

Derby Aviation's Diverse Operations

IT is perhaps a little surprising to arrive at Elstree Flying Club and see a placard reading "Derby Aviation." But this is by no means the only surprising aspect of an organization which has survived the loss of Service flying school contracts to become a growing independent operator and control a flying club which offers training to a standard not easily obtainable outside specialist organizations. Derby Aviation's swords have been beaten into shares, and the shares are beginning to pay dividends.

The explanation of Derby's influence at Elstree is contained in the organization of the parent holding company, Air Schools, Ltd. Derby Aviation, whose headquarters and flying club mess are at Burnaston House, Derby, are responsible for the maintenance and flying services at Derby Airport but also operate the small Derby Aero Club and the Elstree Flying Club.

Air Schools was formed as an R.F.S. at Derby in 1938 by the late W/C. Roy Harben, D.F.C., and became—along with Derby Aero Club—the first occupant of the newly opened airfield. Residents of Derby became accustomed to seeing Harts and Hinds overhead, although it must remain a matter for conjecture how many people could make the distinction.

The outbreak of war involved the replacement of the Derby R.F.S. with an Elementary Flying Training School, and the expanded scope of Air School's operations—and circuit congestion—may be visualized from the somewhat staggering total of 108 Magisters on the strength. Despite these large numbers, No. 16 was justifiably proud of maintaining the lowest accident rate of any E.F.T.S. The insistence on sound airmanship and discipline that this record required is maintained in the flying training given at Elstree today.

The first expansion of the growing organization was the formation of No. 28 E.F.T.S. at Wolverhampton, where, as at Derby, the civilian organization was responsible for the operation and maintenance of the aircraft. These para-military activities continued after the war with the reappearance of the R.F.S. at both Wolverhampton and Derby, the former operating Tiger Moths until its closure, although by then re-equipment with the equally popular Chipmunk was well under way. Wolverhampton and Derby Aero Clubs revived as well, and the clubhouses which they had occupied before the war were an asset considerably envied by less fortunate clubs. At this time, too, Derby Aviation made its first venture into the charter field with the acquisition of four demobilized D.H. Rapides.

For many civilian operators who had relied on Service training contracts, this was a crucial period, but the four Rapides wearing the dark-and-light-blue livery of Derby Aviation were immediately put to work on the first of several scheduled services to be developed—in the first instance, flights between Derby or Wolverhampton, Birmingham and Jersey. There is a very considerable seasonal demand for passage between the Midlands and the Channel Isles, and in early 1955 it was found possible to introduce a 36-seater DC-3 onto this route. Nottingham was also included in the towns served, although the Derby-Nottingham stage-length is too short to be economic by air and at present is served by a connecting coach service. Operating rights at Nottingham are, however, retained.

Recent growth has been rapid. Now only one Rapide remains, but a second Dakota (Viscount Montgomery's war-time aircraft) has been overhauled by the Derby maintenance facility and added to the fleet, which also has the unique distinction of being the only British company operating Marathons. The purchase of these aircraft, powered by Gipsy Queen 70 Mk 4 engines, enables one DC-3 to be more or less permanently devoted to the long-term charter work for which Dakotas are in great demand.

Elstree instructors. Left to right: David Ogilvy, C.F.I., W. H. Bailey, K. Howard and A. E. Vernon.

Although two of the Marathon's seats have to be sacrificed for the Jersey run, very high load factors for the short season are ensured by full bookings in February, and the aircraft are utilized for two and a half return trips every day. Flying operations are the responsibility of Eric Lines, who until recently was with Air Schools at Wolverhampton. He has a staff of four pilots.

The successful operation of the various aircraft is largely due to the hard work of the company's technical director, Throttle-Bender Ron Paine, who is assisted by the chief engineer, K. W. Felps. This aggregate of experience is reflected in the approval of Air Schools as a maintenance organization for aircraft up to Dakota standard, and for the contracting of considerable outside overhaul work.

Few carriers can yet boast that theirs is a family business, nor are they likely to establish a precedent if they do, for Mr. Felps has both father and brother occupying administrative positions.

All organizations reflect in some degree the personalities of their officers, and nowhere is this more evident than at Derby Aviation's flying school at Elstree Flying Club. Faltering faith in the need for a healthy background of private flying to a nation committed to commercial aviation can hardly fail to be reassured by contact with David Ogilvy, the manager and chief flying instructor. An ardent protagonist of flying for sport and for its own sake, he gives to Elstree a rare spirit of enthusiasm which is reflected in the instructional facilities that are offered. Both David Ogilvy and Ron Paine (who is responsible for Elstree) find additional outlet for their enthusiasm by racing single-seater aircraft, the latter the well-known Hawk Speed Six and the former the venerable Comper Swift *Black Magic*.

The last few years have shown a steady increase in the club's flying tempo. In 1952, a fleet of two Austers and a Magister flew 620 hr; last year with an average fleet of three Austers and three Magisters, which were later joined by a Gemini, the hours flown mounted to 3,168. Already this year, with the aircraft state increased to four-all and the Gemini, 2,000 hr have been flown in six months. Nine Chipmunks are being overhauled and converted at Derby, and although seven are to be sold, the club will benefit from the remaining two for the advanced instruction in which it specializes. Both Chipmunks and one of each of the other types will be suitably equipped with radio and lights for instrument and night flying. Some difficulty is being experienced in clearing the Chipmunk for civilian use; and the lower overhaul period of the Gipsy Major 10 will result in increased costs per aircraft flying hour—apart from the difficulties of repairing aircraft of metal construction.

Instruction under David Ogilvy strenuously avoids the "dodgem at the fair" principle, where the pupil comes to the aerodrome, pays, flies, and goes away. Printed notes are issued to the pupil after his first instructional flight, at the circuit stage, after first solo and prior to taking the private pilot's licence. Each set of notes explains what has taken place so far and examines the next step forward, besides continuously preaching the tenets of good airmanship. In addition all instructional flights are supported by pre- and post-flight briefing by the instructor. Thus, with dual and solo flying charged at the same rate, the pupil is offered very good value for his money. Supplementary lectures are also given once a week during the summer and twice a week in winter.

Service of this nature can only be provided if adequate instructional staff is available, and the club is fortunate—or provident—in having four full-time instructors who are fully rated and approved by R.A.F. Home Command, and four part-time instructors, two of whom took their instructors courses at Elstree. As C.F.I., David Ogilvy is also a member of the pilotage committee of the Association of British Aero Clubs, and is responsible for writing pilot's notes and rewriting the instructor's rating course.

With this background, Elstree offer considered courses for the private pilot's, instructor's and commercial licences. At a time when there is an increasing shortage of pilots in the Corporations, the opportunities for commercial training which the course provides should not be ignored by aspirants for flying posts. The attainment of professional qualifications is inevitably somewhat expensive, and in this field scholarships are sadly lacking; but the investment of about £700, which is required to train a pilot *ab initio* to a suitable airline entry standard, can be regarded as reasonable in view of the eventual salary and status which can be attained. Accommodation costs are not included in this figure, but suitable local arrangements can generally be made. The course consists of 200 hr flying, of which 100 must be flown solo, with ten hours of night flying and basic instruments. Apt pupils should find it possible to progress to instrument rating standard in this time, aided by Link trainer exercises. The demand for the trainer is such that a full-time instructor is now employed, so that serious practice can be undertaken throughout the day.

The theoretical requirements of the commercial licence can largely be met by the study of comprehensive notes which have been written by the instructional staff, assisted if required by the more specialized correspondence courses offered by firms such as Avigation. With full-time attendance, it should prove possible to obtain a commercial licence in less than eighteen months.

These courses also cater for the personnel from airline companies who wish to obtain a commercial licence or take a refresher course in their spare time. Summer operations until dusk make this quite practicable.

While by no means the only firm to combine M.T.C.A. approved training with club flying—Thruxton and Southend are other notable examples—Derby Aviation is able to back Elstree with unusually comprehensive facilities, and the opportunity of embarking on a civil aviation career from a private rather than commercial background has much to recommend it. Private flying still needs the stimulus of active training which such courses can offer if it is not to stagnate, and the airlines should benefit from a continued influx of young men who are able to appreciate an aeroplane for its own sake. Flying clubs are offered disguised subsidies in the form of A.T.C. training and the A.B.A.C. works flying scheme. How much more valuable a commercial licence scholarship would be.

A. T. P.

CLUB AND GLIDING NEWS

BY sending eleven aircraft to Flers for the 9th International Rally of the Aero Club of Lower Normandy, the Surrey Flying Club won the Claude Salle Trophy, awarded to the club with most aircraft at the rally. This is the first time the trophy has left France and it now occupies a place of honour behind the bar at the S.F.C. clubhouse at Croydon. Another win was the Bagnoles-de-l'Orne Cup, awarded to the entrant with "the best looking and most comfortable aircraft" and who "presents the aircraft in the most cheerful manner." This went to W.J.A.C. members Mrs. Mavis Harriott and Miss Hazel Prosper in a Tiger Moth. Another first, of a different nature, was set up later during a lavish banquet on the opening night, when the first British guest to be carried out horizontally proved to be a Surrey member.

FIRST newsletter of the Vickers-Armstrongs (Hurn) Flying Club covers the initial seven months of the club's existence and records a big increase in hours flown with the improved weather and lighter evenings of May and June. At present eight members (four trained by the club) possess P.P.Ls., an equal number are approaching this stage, and 15 are under instruction. There are 32 members, with 85 on the waiting list. At the beginning of May the number of subsidized flying hours approved by the company for the first year was increased to 810. During June a social evening was held at Christchurch. The newsletter concludes: "Finally, hearty congratulations to Messrs. Fuller, Keeble and Oram (not to mention myself) for obtaining their P.P.Ls., and to Messrs. Vaughan, Pearson, Gorringe, Joy, Gough and Cox for achieving solo standard.—B. Shepherd, secretary."

MEMBERSHIP of the Puffin Aero Club at Chivenor, North Devon, has greatly increased during the past few months. Flying hours are well up on the Auster Mk 5 G-AJXC, and the club has just acquired a Magister, G-AKAT, for continued instruction. The Auster is still maintaining the air link with Lundy Island, due to Belgian registration troubles with the Miles Aerovan the club owns. Any private pilots on holiday in North Devon will receive a welcome if they care to visit Chivenor.

TOTAL membership of the Southport Aero Club is now over 40, ten of whom are taking instruction towards their P.P.Ls. One recent *ab-initio* solo was by a new member who is over 50 years of age. "We operate off the sand aerodrome at Southport," secretary David Vernon writes, "and although this has many disadvantages—such as the tide, and having to wash the aircraft down each time we use it—we are not subject to lengthy perimeter tracks to taxi around, and we have achieved some very rapid turn-rounds between flights." The club's Tiger Moth is operated at 45s per hour, and all work is performed voluntarily by members. Other enthusiasts in the Southport area are reminded that the secretary's address is 146 Roe Lane, Southport.

AVRO Gliding Club has devised a co-operative means of overcoming a lack of launching equipment. Six members have "syndicated" a Ford V8 autotow car for use on the 1½ m runway at Woodford. This should prove useful for a high launch when the elusive "Woodford wave," formed in the lee of the nearby Derbyshire hills, appears again.

AT Polebrook Aerodrome, twelve miles from Peterborough, the Perkins Gliding Club is now operating with 55 members. Club aircraft comprise two Kirby Cadets and one Tutor. The chief flying instructor, John Hulme, is also an instructor with the Cambridge University Gliding Club, while all the remaining members are employees of the F. Perkins diesel-engine company of Peterborough. Club chairman is W/C. Morgan Griffiths.

BEAU GESTE

A Valiant in North Africa

VICKERS-ARMSTRONGS Valiant B.1 number WZ393 was one of two machines of its type to operate in the recent NATO air exercise called "Thunderhead." On the strength of No. 214 Squadron (home base Marham), it flew from Idris, Libya, where these pictures were taken. The crew members seen below are: (l. to r.) F/O. G. G. Ness (co-pilot), P/O. D. J. Walter (signaller), S/L. J. A. G. Slessor (captain), F/O. D. A. Parr (navigator), F/O. G. M. Perrin (nav.), and C/Tech. R. Sewell. No. 543 Squadron supplied the other Valiant.

"BIRD OF SKIN AND BONE"

Helicopters in Western Papua

By GEORGE FARWELL

HOVERING over the steamy jungle of Western Papua, the helicopter pilot surveyed mile upon mile of dense green timber below, then slowly made a descent to a small clearing where khaki-clad Europeans awaited him. From the perspex blister of the cabin stepped a dark-skinned Papuan with frizzy hair, his long bow grasped in one hand. Beneath the other arm he carried a squealing pig.

From the sago palms nearby some of his tribal friends ran forward to greet him excitedly. For all his wild appearance, this stocky, almost naked man was merely a labourer returning from hospital to an oil survey party employing him. He had brought with him both his food and weapons.

No one in this remote jungle clearing saw anything unusual in the arrival of a near Stone Age man from the skies. To many villagers in Western Papua, not far removed from head-hunting and cannibalism, the helicopter with its whirring rotor blades has become a normal feature of life—even to those who have never seen a motor car or bicycle. The Papuans, having no words of their own for mechanical objects, have come to call this queer machine with its bare framework simply "Balus Bone Nating." (*Balus* is Pidgin English for bird; *Bone Nating* (nothing) means "just skin and bone.")

Helicopters in the past few years have revolutionized transport methods throughout this humid and exhausting region of the tropics—at least so far as prospecting for oil is concerned. There are no roads back there, not even an air strip, and Government patrols in the interior still have to rely upon wearying journeys by foot, cutting their way through almost impenetrable jungle with a long string of Papuan carriers.

For prospecting something like 50,000 square miles of jungle, swamp, mountain and steep valleys scoured by rushing torrents, travel by foot was obviously impossible. The job would have taken too long. That was why the Australasian Petroleum Company, now making an all-out effort to strike oil in one of the world's most difficult terrains, decided to call in helicopters. (The A.P.C. is jointly owned by British Petroleum, Ltd., and Vacuum Oil Company, Ltd., each with a 45 per cent interest, and Oil Search, Ltd., an Australian company.)

An approach was made in 1954 to one of the most experienced operators in the United States, the Bahamas Helicopter Company, which had carried out similar work in many parts of the globe. A new company was formed, World Wide Air Services, Ltd., and equipped with four Bell 47 D-1 helicopters. From Los Angeles Seattle-born Arni L. Simarlidason went out as managing director, with several American pilots.

Papuan fisherman, disturbed out of their stone-age routine, do not know what to make of this "bird of skin and bone."

After landing near a Papuan village in his Bell 47 D-1, Arni L. Simarlidason does his best to make polite conversation.

"Helicopters," Simarlidason said recently in Port Moresby, headquarters of the A.P.C., "are only called on when the job is too costly or difficult for normal aircraft types. I guess we're always left to do the really tough jobs." And in Western Papua the jobs done by his pilots, among whom are several Australians, really can be tough.

The helicopters are out in the front line of attack, carrying on vital reconnaissance work that has to be followed up later—much later—by the heavy artillery of drilling rigs. Commercial oil deposits can only be located by drilling deep wells, but it is essential first of all to select the most likely areas. Early exploration is carried out by survey parties using seismic methods. These involve the use of dynamite charges which produce shock waves below ground, their echoes and ripples being recorded on extremely sensitive instruments. In this way the conformation of rock structures deep below the surface can be mapped and possible oil reservoirs determined.

Seismic parties have to cover vast areas of difficult country in this search. Not only would it have taken them many years with foot patrols and carriers, but their delicate instruments might well have been damaged. Helicopters have enormously simplified the work.

Capable of lifting 400 lb, they have been used to ferry dynamite, food, essential equipment—and, of course, surveyors and their Papuan assistants. Seismic parties, which may remain in the field for several years at a time, consist of up to 40 men. They often employ as many as 500 Papuans as well, whose work is to clear areas of jungle for landing grounds.

World Wide Air Services has worked out a system whereby one clearing is made every mile. This involves a very large amount of work, but is an essential safety measure in case of forced landing. The machines have to fly at 1,500 feet or less, because of the perpetual low cloud ceiling in a region that averages 300 inches of rain annually. But the frequency of landing grounds is primarily determined by the nature of survey operations.

The driller, with his dynamite and equipment, has to move in a straight line through the jungle, followed by technicians with their recording instruments. His progress can be made much speedier and less laborious by the helicopter's ability to leap-frog over obstacles and drop supplies.

Since this kind of movement is practically continuous, the machines are in use all day long. Here, for instance, is a typical day's operation:—

7.30 a.m.: Helicopter takes off from temporary base camp, making a succession of flights with two tons of dynamite (70 cases) for blasting site four miles away.

11.00 a.m.: Flies another 20 miles to pick up a shooter or driller, with all equipment, transporting him to a new position.

Noon: Returns to base, for further orders.

12.30 p.m.: Take off with rations for seismic crew in field.

1.45 p.m.: Ordered to proceed to landing ground 35 miles distant to pick up and transport further party, making several short trips.

3.00 p.m.: Carries observer to new site, ferrying 3,000 lb of gear in several flights.

4.00 p.m.: Receives emergency radio call from clearing nearby to fly sick labourer back to base for medical attention.

5.30 p.m.: Takes fresh loading of stores from flying-boat just landed on river from Port Moresby, 400 miles away.

"BIRD OF SKIN AND BONE" . . .

There is no end to the type of job these jungle work-horses have to undertake. The most valuable, undoubtedly, is the carrying of instruments that would be knocked about in surface porterage. But the biggest quantity is represented by dynamite, which is at least 60 per cent of all loadings. In just over two years the company's four helicopters—three in regular service, one as a standby or relief machine—have flown more than 6,000 hours, moving some 2,500 tons of material.

Despite the dense jungle country in which they normally operate, the clearings made for take-off and landing are not a serious problem. They need only to be small, normal size being 100ft by 300ft. In most cases small landing platforms are built of timber planking, obviating the need to cut trees to ground level. They can also be more easily built above the height of dense and spiky *kunai* grass, which often grows to a considerable height.

The helicopters themselves have been used to fly out timber for their own landing platforms in treeless or swamp areas. Other landings are made on the cabins of boats moored in some river, or on decking placed on primitive dug-out canoes. Since the machines can be equipped with floats as well as the usual small landing wheels, pilots are able to put down on marshes, rivers and ocean beaches.

Were they not able to do so, the machines could never be overhauled and maintained, for they have to fly from remote points in Western Papua back to Port Moresby, the closest town of any size.

The Papuan capital is some 450 miles by direct flight, but at least 500 on the route helicopters must take. Owing to their limited range, they must put down every 100 miles or so to refuel. Spare cans of gasoline are carried for this purpose, but the only possible landing spots are along coastal beaches, or in ocean shallows. This requires them to follow the great arc of coast-line along the edge of the Papuan Gulf. These beaches are virtually uninhabited, except for a few scattered fishing villages where men sail among reefs and dangerous surf-bound rocks in *lakatois* (two canoes bound together, with large sails) and frail outrigger canoes.

The villagers in these parts are still astonished by the sight of this strange, whirring bird that descends upon them out of the skies. As a rule, pilots say, their initial fear of the unknown monster soon gives way to curiosity—and later to an enthusiastic welcome for the ever-perplexing European who can always be counted on to introduce some new mystery into a life which, for them, has known no change for countless centuries.

Familiarity breeds content—in the case of this Papuan worker about to fly to an oil site in the white man's helicopter.

Even more significant, perhaps, is the fact that distant, still uncivilized Papua is the only Australian territory in which helicopters are being commercially used. Within Australia there are navy and air force examples, but no helicopter pilots with commercial licences exist outside Papua.

World Wide Air Services have recently extended their operations to Dutch New Guinea, carrying out similar work for oil prospectors. Latest development in Papua has been the purchase of a Catalina flying boat to carry oil men, technicians, food and equipment from Port Moresby to the scattered depots along the coast and tidal rivers, providing a daily charter service essential to the search for oil. It is a joint Australian-United States effort that will help, if oil is discovered, to win new wealth from one of the world's most backward regions.

PRACTICAL CATS

OWNED and operated by Mr. Alfred T. Whiteside of Jacksonville, Florida, the five-seat Wildcat pictured on the left below is one of half-a-dozen swords-into-ploughshare versions of the former Navy fighter now flying in the U.S.A. The entrance door is on the starboard side of the fuselage to the rear of the two windows. The seating arrangement is unusual. Two of the four seats face rearwards and back on to the bulkhead behind the pilot's cockpit; the remaining two seats are on the port side, facing the entry hatchway. The floor is plywood-covered and the side-by-side seats of wooden construction with foam rubber backing and seating, the whole being leatherette-covered. The interior design is the work of Falstaff Opendraws. Powerplant is normal for an Eastern FM 2, a Wright R-1820-56. The Wildcat's feline companion (seen flying on the right) is a hybrid Grumman G-58A Bearcat. It has an F8F-2 airframe with F8F-1 engine (R-2800-C), is owned by Grumman and was built from spares.

F A I R E Y

ACHIEVEMENT

In operation

The Fairey Gannet has proved in service to be the world's most successful anti-submarine aircraft, combining the ability at once to search and to strike decisively with newly-developed weapons.

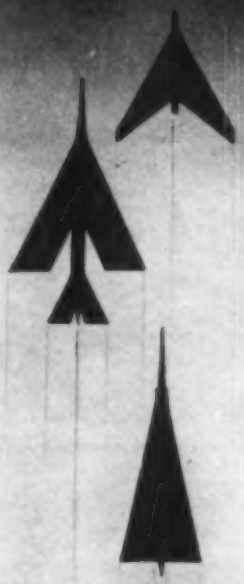
In production

The Fairey Gannet was one of the first of the super-priority aircraft in service. Rapid production, complete interchangeability, no time-lag between prototype and production—these are the advantages of Envelope Tooling, a revolutionary method of assembly invented, designed and developed by Fairey.

THE FAIREY AVIATION COMPANY LIMITED

ENGLAND · AUSTRALIA · CANADA

pioneer designers of the ejection seat



UNPARALLELED ACHIEVEMENTS

Squadron Leader J. F. Fifield, D.F.C., A.F.C., made aviation history when he successfully ejected from a Meteor aircraft at runway level during September and again the following month at an altitude of more than 40,000 feet.

Martin-Baker Fully Automatic Ejection Seats were used for both tests, proving yet again that these seats are undoubtedly the finest in the world of aviation.

NOTE TO AIRCREW:

The Seat used for the runway ejection was fitted with modified time release, not yet incorporated in Service equipment.

MARTIN-BAKER

The de Havilland Devon C.1 and Handley Page Hastings Met.1 bear the new markings referred to in the leading paragraph on this page. The third machine is a Bucker Bu 181 Bestmann with a curious history. Built by Bucker in Rangsdorf before the war, it was purchased by the Royal Swedish Air Force but since the war has been re-purchased by Germany, where it is now flying in the guise shown.

AIRCRAFT INTELLIGENCE

Great Britain

R.A.F. Squadron Markings. The hitherto somewhat drab appearance of squadron and unit aircraft of R.A.F. Transport and Coastal Commands is now being brightened to conform more closely to the colourful standard set by Fighter Command. Coastal Command Avro Shackletons, for instance, now carry the squadron number on the side of the fuselage, plus the squadron badge and individual aircraft letter on the nose. Squadrons with aircraft so marked include Nos. 224, 120 and 269 (224 with Shackleton M.R.2s, and 120 and 269 with M.R.1s). The Handley Page Hastings Met.1s of No. 202 Squadron, Aldergrove, have recently shed their drab-grey finish for the new Coastal Command blue, plus white lettering and "cheat lines" as shown on this page. The squadron number is painted on the fin, in grey on a white circle, and the individual aircraft letter is on the nose. Transport Command aircraft carry squadron or unit markings on the fin (see photograph of Blackburn Beverley on page 104 of last week's issue). The letters are white, on a green background. Devons and Ansons of the Metropolitan Communications Squadron, based at Hendon, now carry a similar marking, though the colours are red/blue with gold "MCS". Other Transport Command units so marked are No. 30 Squadron (Valettas) and No. 1312 Flight (Hastings).

U.S.A.

U.S.A.F. Designations. "Experimental" designations recently announced by the U.S.A.F. include the following: Lockheed X-7 (Mach 3.5 missile powered by Marquardt ramjets); North American X-10; Douglas X-12 (Mach 5); Ryan X-13 (V.T.O. powered by one Rolls-Royce Avon); Bell X-14 (high-speed V.T.O.); North American X-15 (Mach 10 at 520,000ft, piloted); and Lockheed X-17 (derived from X-7). Weapons systems include: WS.104 (North American Navaho Mach 3.5 pilotless bomber with ramjet power); WS.107 (Convair Atlas I.C.B.M.); WS.110 (Boeing Mach 2 bomber with ethyl borane fuel); WS.125 (nuclear-powered Lockheed bomber); WS.202 (cancelled intercepter); WS.300 (fighter/bomber); WS.302 (Martin tactical bomber); WS.312 (Martin Titan I.C.B.M.); and WS.312 (Douglas Thor I.C.B.M.).

Boeing B-52 Stratofortress. Described by Boeing as the "flyingest" B-52 at the Seattle plant, the aircraft serial-numbered AF-52-002 has logged 370 hours' flying in little more than two months. This programme was undertaken for the intensive testing of a modified alternator drive and the 44 flights included 212 touch-and-go landings.

Lockheed C-130A Hercules. Some intensive flying has lately been chalked up also to the credit of a Lockheed C-130A turboprop transport. It was in the air for 40 hr 30 min out of 49 hr 30 min while undergoing U.S.A.F. flight tests. Six Lockheed crews alternated at the controls on its eight 5-hr flights.

DE HAVILLAND COMET T.2
(Four Rolls-Royce Avon 117)

Span	...	...	115 ft.
Length	...	...	96 ft.

WORLD GLIDING

British Pilots Win in Two-seater Class at St. Yan

By KENNETH OWEN and ALAN YATES

THE second week's flying in the world gliding championships at St. Yan produced no serious challenge to the first-week leaders in either of the two categories. The quiet American, Paul MacCready, continued with his own consistent blend of science and accurate flying to push firmly ahead at the top of the single-seater list, ignoring the fact (which, it seemed to others, *ought* to have mattered) that he had hardly flown a glider since Camphill two years ago, and that he was now flying a borrowed machine with which he was not familiar.

The most notable victory, however, was that of the British pilots Goodhart and Foster in the Slingsby T.42 two-seater, who during the second week strengthened their hard-gained lead, ably backed up by the loyal and efficient crewing of Lorne Welch and Peter Flower. Their victory was notable because they were flying not a high-performance competition sailplane, but a simple and sturdy Yorkshire product—"whittled out of a piece of wood" by Mr. F. N. Slingsby and intended for training use. Against them were ranged some of the most sophisticated pieces of precision soaring machinery ever built at Government expense.

The final top placings in the championships, which concluded on Friday last, July 13, were as follows:

Single-seaters:—

1. MacCready (U.S.A.), Bréguet 901s. 4,891 points.
2. Juez (Spain), Slingsby Sky. 3,806 points.
3. Gorzelak (Poland), Jaskolka Z. 3,576 points.

Two-seaters:—

1. Goodhart and Foster (Great Britain), Slingsby T.42. 3,828 points.
2. Rain and Stepanovic (Yugoslavia), Kosava. 3,187 points.
3. Sadoux and Bazet (Argentina), Condor 4. 2,748 points.

Last week's report from St. Yan contained an account of the flying up to Friday, July 6. At the end of the first week, after five contest days, MacCready was leading the single-seater class with 3,382 pts followed by Juez (2,709), Saradic of Yugoslavia (2,699) and Gorzelak (2,670). The two-seaters were headed by the British T.42 (2,501 pts), with the Yugoslav Kosava in second place (2,333) and the Polish Bocian Z third (2,154).

On the Friday morning the sixth congress of OSTIV (Organisation Scientific et Technique Internationale du Vol à Voile) was officially opened in St. Yan village. Among the speakers at the opening ceremony were Dr. Walter Georgii, honorary president, and Mr. L. A. de Lange, president.

Saturday, July 7. The Dutch pilot Toutenhoofd, who had flown furthest the previous day, had not returned to St. Yan by this morning and, although the organizers had originally planned to set a task for the day, they decided against this after discussion with the Dutch and other team captains. A rest day was accordingly declared.

Sunday, July 8. There was again no cloud in the sky early in the day and the temperature soon rose into the eighties. A layer of high cirrus cloud then approached from the south and by the time launching began at 1.30 p.m., the power of the sun was already weakened by the cloud cover.

The task set was a race to Beaune, 100 km to the north-east. It seemed that pilots launched early might keep in the bright sunshine and soon reach their goal. It transpired, however, that the air was very stable and that thermals did not penetrate above 2,000ft. Several groups of ten or more gliders were seen circling endlessly but not climbing appreciably. Many landed back on the airfield for another aircraft tow. Others, including Philip Wills, flew off towards the goal hoping to find better conditions, but few exceeded 15 km before landing. Eventually it was clear that no one would reach the goal and, in fact, since only one glider exceeded 50 km, it was declared a "no contest" day. Nearly 150 aero-tows had been made without avail.

Monday, July 9. Again blue skies—but the meteorologists forecast that the great cumulus clouds, seen in the distance yesterday, might come nearer today. The task was given as a race to Moulins and back—about 120 km in all. The take-offs began at 12.30, and all 56 sailplanes were in the air 35 minutes later.

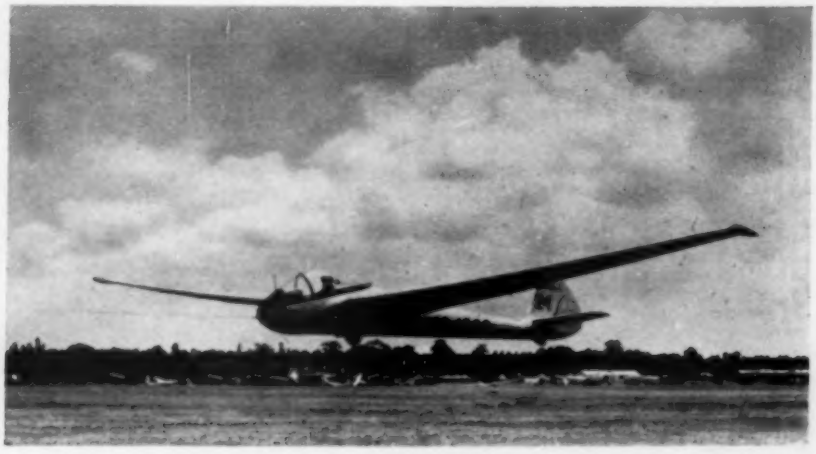
It was at once obvious that the thermals were better than those of yesterday. Several swarms of 12-15 sailplanes circled to gain height before flying across the starting line to be timed at the beginning of the race. Even as they climbed, large cumulus clouds were to be seen coming up from the south and in the direction of Moulins (west-northwest) an enormous "cauliflower top" could be seen. It seemed probable that pilots, having been recognized at the turning point, would climb high in this cloud and return in a fast glide within an hour or so.

Conditions were, in fact, more difficult than they seemed. Most pilots reached the turning point but no one succeeded in regaining St. Yan. The clouds seen from St. Yan had crossed the return track before the gliders had returned very far. The rain and hail from them had stopped thermal activity so that pilots could only glide back as far as possible in dead air, or deviate far to the north in trying to gain enough height to reach St. Yan. Several pilots landed well off track, and the marking system (which gave all its points for distance since nobody had completed the race) penalized those who did so.

The best performance of the day was by the British Slingsby T.42 two-seater flown by Nick Goodhart and Frank Foster. They were launched among the later gliders and met the large clouds

Below, Paul MacCready, world champion. Crewing for his son was Dr. Paul MacCready, Sr. Right, the Polish Jaskolka Z flown by Gora, whose colleague Gorzelak came third.

"Flight" photographs



The Slingsby Skylark 3 flown by José Ortner of Argentina (left) was one of six entered for the championships. Others included those of Stephenson (who came sixth) and Wills (tenth).

"FLIGHT" photographs

Morning rigging of the two-seater HKS-1 (below), flown by Haase and Heinzel of Germany.

on the way to Moulins, then reported by radio that they had entered the storm and were climbing in it. They reached 17,000ft, having endured a hailstorm, and were able to reach Moulins at 7,000ft under an overcast sky. Fortunately their radio and that of a British radio van at the turning point enabled recognition to be made at that height. The glide back home took them under the same large clouds but, by now, the lift had gone. After a long glide with only occasional lift they got within ten miles of St. Yan to earn the day's maximum points, 800. Of the other two-seaters, only the Argentine Condor reached the turning point. This fine performance consolidated the British lead in the two-seater class.

Not one of the single-seaters did as well as Goodhart and Foster's two-seater. Kumpost of Czechoslovakia in his Démant sailplane and Paul MacCready in his borrowed Bréguet 901 were the most successful single-seaters. MacCready obtained nearly full marks and made his lead almost impregnable. The storms did not bring much rain to St. Yan but were very heavy elsewhere in France. They seemed to have broken the sequence of very hot days.

On Monday evening, after six contest days, the leading positions were:—

Single-seaters:—

1. MacCready (U.S.A.)	4,149 points
2. Gorzelak (Poland)	3,283
3. Juez (Spain)	3,212
4. Saradic (Yugoslavia)	3,125

Two-seaters:—

1. Goodhart and Foster (Great Britain)	3,301 points
2. Nowotarski and Sandauer (Poland)	2,404
3. Rain and Stepanovic (Yugoslavia)	2,387
4. Sadoux and Bazet (Argentina)	2,158

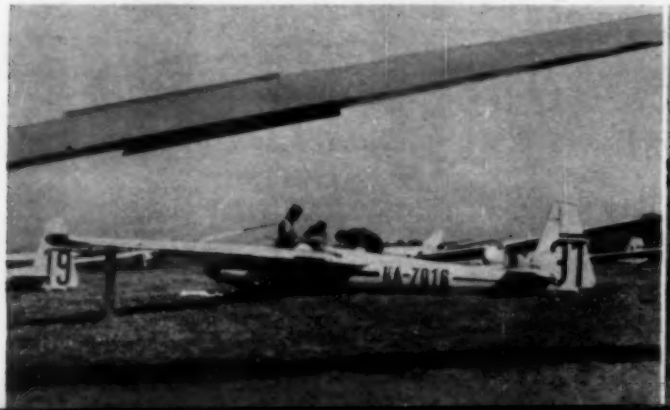
(Geoffrey Stephenson had scored 701 pts. and Philip Wills 360 pts. for the day's flying and were now 12th and 16th respectively in the single-seater class.)

Tuesday, July 10. Heavy grey clouds produced steady rain by lunchtime and there was obviously going to be no flying today. The relief from the sticky heat was welcome and the frequent allusions to "Camphill weather" caused no depression among the large British contingent. Wills and Stephenson were now well down the single-seater list—but so were other previously favoured candidates for the championship like Pierre (14th) and Wiethüchter (20th).

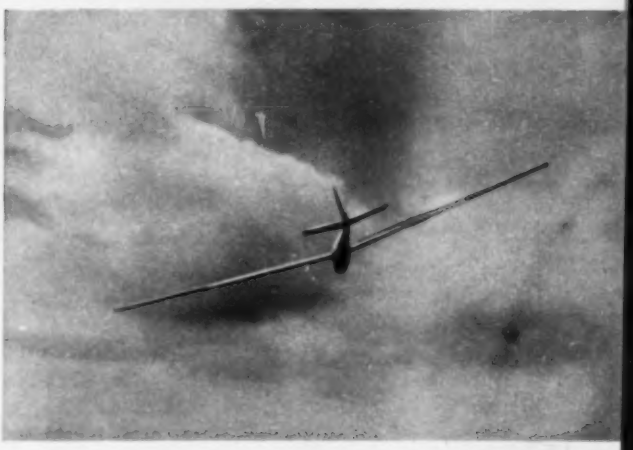
Our two-seater was, however, comfortably at the top of its class. As Mr. Slingsby pointed out in a lecture to OSTIV delegates which was well attended by competing pilots, the T.42 was "only a training machine!" The achievement of outflying the expensively beautiful Czech, German and other two-seaters was thus underlined.

Wednesday, July 11. After a night of rain and strong wind, during which several crews left their beds to picket their trailers more securely, the morning sunshine and cool wind were reminiscent of good English summer conditions. By ten o'clock cumulus

Below, left, work on the Hungarian Z.08 flown by Mezo. Right, Bill Ivans, Jr., of America, prepares for the first take-off of the championships in Elliotts' Olympia IV. Ivans was injured and the machine extensively damaged on landing near Crest, in the Dauphine Alps, on July 11.



Two-seater class world champions, Nick Goodhart and Frank Foster, obviously pleased with life after the goal race to St. Etienne. Below, photographed from the T.42, the Bréguet 901s flown by Silesmo of Sweden and (bottom) the Swiss Elfe M flown by Hans Nietlispach.



WORLD GLIDING . . .

were already in evidence. The task was set as a race to the gliding centre of St. Auban in the mountains 300 km to the south, only 80 km from the Mediterranean. When launching began at noon the clouds looked excellent. They covered about half the sky and sailed along in streets towards the goal.

Half-an-hour later columns of sailplanes, having battled upwind, were circling to reach the cloudbase before making the required one-kilometre straight dash across the starting line. By one o'clock all had vanished downwind. Several, including the German HKS and Yugoslav Meteor, were clearly flying at maximum speeds of around 140 m.p.h. and, aided by a wind speed of about 30 m.p.h., were soon well on the way to St. Auban.

The trailer crews, faced with nearly 800 km of driving in a mountainous part of France, streamed out of the gates as the gliders took off. Many, including the British, had left earlier and were driving south at maximum speed so that they could maintain radio contact with their sailplanes for as long as possible. The air-to-ground range of about 80 miles should ensure continuous contact for an efficient crew.

It was soon clear that the weather conditions *en route* were not as favourable as they remained at St. Yan. Here the wind dropped and, in pleasant English-summer conditions, we awaited telephone reports of the landings.

By six o'clock no reports from the goal had been received and about half of the competitors had reported landing short, many of them in the Rhône valley to the west of track. By radio we learned that the British two-seater was ahead of Wills and Stephenson in their Skylark 3s, but soon Goodhart and Foster were down about halfway to the goal. Then came the first reports from St. Auban; Nietlispach (Switzerland, Elfe M) and Wills had succeeded in getting there. Gradually, landing reports from the other aircraft came in, and it transpired that the following seven pilots had finished the day's race:—

	hr	min
Nietlispach (Switzerland)	4	37
Wills (Great Britain)	4	53
Stephenson (Great Britain)	5	40
Feddersen (Denmark)	6	21
Dommisse (South Africa)	6	25
MacCready (U.S.A.)	7	02
Toutenhoofd (Holland)	8	20

No two-seater had been successful and the single-seaters had found conditions very difficult indeed. The early cloud streets had soon ended and the strong north-easterly mistral had blown pilots off course and produced extremely rough air down among the mountains. Those pilots who hill-soared the long ridges below the cloud-covered tops were thrown about violently, and strong downcurrents forced several pilots to land in small, rocky fields. The friendly Bill Ivans (U.S.A.) was injured and his British Olympia IV badly damaged on landing in such a field near Crest, in the Dauphine Alps. "Pelly" Persson of Sweden gallantly landed his Weihe in the nearest safe field, two miles away, and went to Ivans' aid.

Those who managed to climb up through one of the holes in the cloud found good wave-lift. Paul MacCready reached 14,000ft and estimated the wind-speed as 55 m.p.h. at 6,000ft, although it was much weaker higher up. The wave lift was as strong as 1,400ft/min in places. Geoffrey Stephenson also reached 13,000ft in the wave.

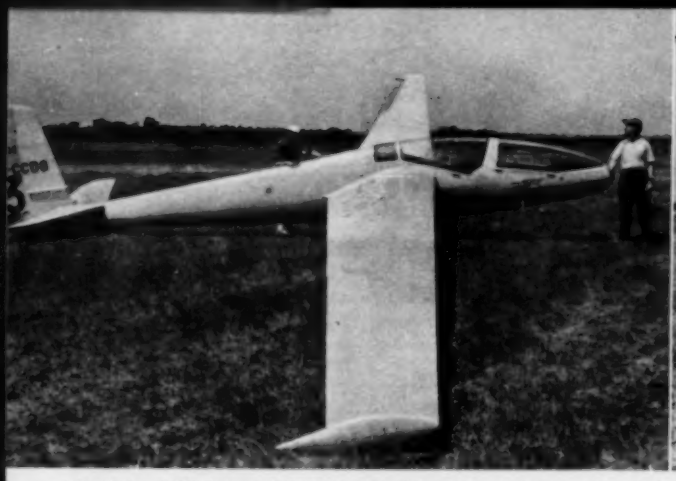
The difficulty in many cases was to find St. Auban beneath the cloud layer. Stephenson cautiously kept plenty of height and arrived above the goal at 10,000ft. The young Dutch pilot Toutenhoofd in his Skylark 3 remained above the clouds for many hours but eventually ventured through them to reach St. Auban after 9 p.m.—producing a shower of sparks from the glider's skid on landing in the growing darkness.

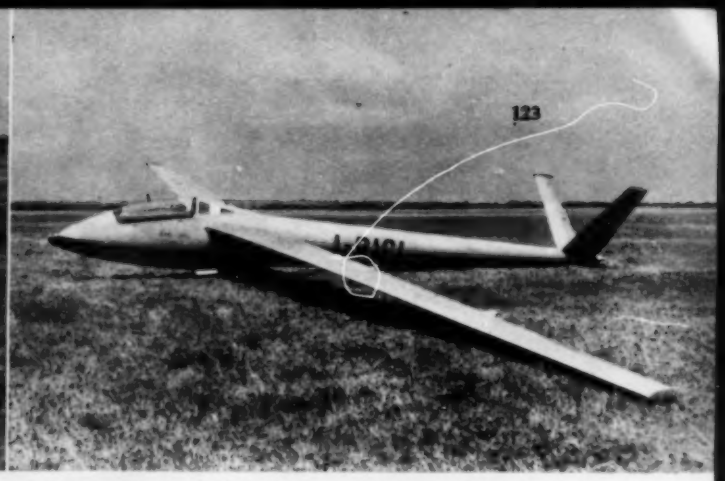
The success of Feddersen of Denmark in his Olympia—a twenty-year-old design—was especially creditable. Three gliders overshot the goal and were unable to fly back upwind to it. Among the seven machines who reached the goal and the three who passed it were four Skylarks and one Sky. After this, the seventh and last contest day, the final leading positions were as given in the table below. There was no flying on Thursday, July 12, as many retrieving crews had not returned to St. Yan.

Britain had thus won the two-seater contest for the first time—and, incidentally, the last: two-seaters are to compete together with the single-seaters in future contests. Cdr. Nicholas Goodhart, R.N., had previously shown his ability in extracting high performances from intermediate-class sailplanes when he won highest points in last year's American national championships in a machine of low-aspect ratio. Assisted by B.E.A.'s Capt. Frank Foster as

THE FINAL PLACINGS

Pos.	Pilot and Country	Glider	Points
Single-seaters:—			
1	Paul MacCready (U.S.A.)	Bréguet 901s	4,891
2	Vicente Juez (Spain)	Sky	3,806
3	— Gorzulak (Poland)	Jaskolka Z	3,576
4	— Saradic (Yugoslavia)	Meteor	3,435
5	William Ivans (U.S.A.)	Olympia IV	3,282
6	Geoffrey Stephenson (Great Britain)	Skylark 3	3,142
7	Ara Torrel (Spain)	Sky	3,097
8	Hans Nietlispach (Switzerland)	Elfe M	3,081
9	Hanna Reitsch (Germany)	Zugvogel	3,042
10	Philip Wills (Great Britain)	Skylark 3	3,031
11	José Ortner (Argentina)	Skylark 3	2,977
Two-seaters:—			
1	Nicholas Goodhart and Frank Foster (Great Britain)	Slingsby T-42	3,828
2	Zvonimir Rain and Vasilije Stepanovic (Yugoslavia)	Kosava	3,187
3	Juan Sadoux and Ricardo Bazet (Argentina)	Condor IV	2,748
4	Kemp Treger and Gene Miller (U.S.A.)	Schweizer 2-25	2,684
5	Guy Rousselet and Louis Trubert (France)	Bréguet 904	2,539
6	Julian Nowotarski and — Sandauer (Poland)	Bocian Z	2,404





The Bréguet 904 (above, left) is developed from the single-seat 901, which now has the distinction of having been world champion sailplane in two successive contests. Flown by Rousselet and Trubert, the 904 achieved fifth place in the two-seater class. The Italian Eolo 3V.1 (above, right), flown by Ferrari, was damaged on the third contest day and withdrawn from the championships.

navigator, radio operator and second pilot, he again put up a sparkling performance at St. Yan for, as mentioned earlier, the Slingsby T.42 Eagle is but a training sailplane and one of the cheapest two-seaters in the contest.

In the single-seat class, sixth and tenth positions were occupied by Geoffrey Stephenson and Philip Wills. This was Stephenson's best performance in the world championship series but Wills, whose fifth post-war contest this was, has been first and second on previous occasions. He was in good company in slipping down the ladder, however, since the 1954 champion Pierre finished eighteenth and several other experienced pilots were well down the list.

An incidental thought is that Hanna Reitsch and Philip Wills—9th and 10th—were flying in championships when some of the present competitors were in their cradles. To retain such a sure touch in the exacting sport of gliding for twenty years is the mark of a great pilot.

No one grudged Paul MacCready his victory. He has been consistently in the first ten at each of the world championships since 1950 and was often unlucky in not being more highly placed. MacCready is a professional meteorologist and a scientist of distinction. Flying very little between contests, he borrowed a French Bréguet 901 for the St. Yan meeting and, after being second on the first day, moved up and retained the lead throughout the 11 days.

Never has a gliding meeting produced such varied weather conditions—to which the respective daily tasks were excellently suited. Pilots gained height in thermals, thunder-clouds, by hill-soaring the French Alps and in waves high above them. In search of pilots who had landed one day in Luxembourg and another day on the Mediterranean coast, the drivers of the retrieving cars and trailers worked magnificently. On several days cars drove over 500 miles in twenty hours—including the time taken to load the glider into the trailer and to tow it, by dark mountain roads, back to St. Yan. All praise to the team captain, Mrs. Ann Welch, and to the various retrieving crews for the excellent British performance.

British-built gliders did very well indeed. The first eleven single-seaters included two Slingsby Skys, three Slingsby Skylark 3s and the Elliott Olympia IV. These gliders were generally less lavishly equipped than their rivals and it is encouraging to know that cheapness does not necessarily imply poor performance. The Fédération Aéronautique Internationale has announced that future World Championships may include a class restricted to cheap, 15-metre gliders. British constructors have a great chance here to produce a cheap sailplane with a performance adequate for many clubs and private owners throughout the world.

Closing Ceremony. On the morning of Friday, July 13, aero-tows were provided for those pilots who wished to exchange sailplanes and for those crew-members who were being allowed to fly the sailplanes they had served so well for three weeks.

The prizegiving ceremony took place under threatening clouds. After a speech by the French Minister of Public Works, the first three pilots in the single-seater class came to stand on the rostrum, Olympic Games fashion, while their countries' flags were raised. The leading two-seater crews were similarly honoured and the magnificent collection of prizes was distributed. Then, as the pilots of each of the 25 countries were in turn presented, their respective national anthems were played.

And so a large number of international friendships were adjourned for another two years; the next venue is undecided, although Poland, Yugoslavia, U.S.A. and France again are all being mentioned. Certainly the organization of this year's championships by the Aero Club of France and S.F.A.S.A. (Service de la Formation Aéronautique et des Sports Aériens) was excellent. The 20 Stampe tug aircraft of St. Yan's Ecole Nationale de Vol à Moteur made 1,000 aero-tows without incident. The 58 sailplanes flew for 3,000 hours, covering distances amounting to 60,000 km, and made 500 "away" landings in fields, on beaches and, exceptionally, on prepared airfields. Most competitors would agree that a second World Championship in France would be very acceptable indeed.

As a footnote to the triumphant performance of Slingsby's T.42 Eagle over France, we may record that its elder brother the first prototype T.42 was at the same time doing a steady job back home. It was hard at work putting in the instructional hours at Lasham Aerodrome, Hampshire, Britain's largest gliding centre—a gliding centre at which the Air Ministry has chosen to provide only one month's security of tenure. May we again point to the great show put up by Goodhart and Foster, and once more suggest that the time is overdue for our gliding prophets to be honoured in their own country—in the obvious and practical way.

Yugoslav pilots were among the leaders in both classes: Rain and Stepanovic (above) flying the Kosava were runners-up in the two-seater class, while Soradic in the sophisticated Meteor (seen, right, just before take-off) came fourth among the single-seaters. Note retractable skid and wheel.

"Flight" photographs

Honfleur, the holiday airport for Trouville and Deauville, is the scene of unusual activity on Air Rally weekend. It has a resident flying club and now receives regular Silver City as well as Air France services. By the Saturday afternoon 81 private aircraft had arrived.

DEAUVILLE – 1956

ONE of the most pleasant occasions remaining for that dying species, the British private pilot, is the annual Air Rally at Deauville. Organized by the Royal Aero Club and made possible through the generous hospitality of Monsieur André, the Rally takes the form (and has done since the war) of a social gathering of club pilots and private owners. Guests must arrive at *La Plage Fleurie* by air, and this year 81 aircraft took part, carrying 286 pilots and passengers. Several aircraft flew from La Baule where, the previous weekend, they had been entertained by Mme. André. There were time of arrival and other simple competitions. In addition a golf match (also annual) was played between the Royal Aero Club and the Aero-Club de France.

Brilliant weather and the friendly Deauville atmosphere made this 1956 Rally perhaps the most enjoyable of all. At Honfleur airport the aircraft park was a stirring and slightly nostalgic sight. Most of the machines are becoming antiques but a better-preserved more brightly coloured collection would be hard to find. Exceptions of a kind to the age barrier were the brand-new red and white Aries (Gemini conversion) belonging to Mr. L. R. Snook and a few late-marque Austers.

"Flight's" Gipsy Major Gemini, "Alfa Kilo Hotel Charlie," takes its place in the line-up of early arrivals.

Deserving winners of the landing competition were J. H. Roberts and D. C. Johnson, who flew two Tiger Moths in formation from Coventry, leaving at 5.30 a.m.

Prize-winning comments on landing at noon on the Saturday were: "Deauville is the aperitif to France," by Mr. R. Gray, flying a Tipsy; "As we get older, Deauville gets younger," by Mr. Kenneth Davies, C.B.E., who flew in his Messenger; "The weather is perfect—typical of French hospitality," by Mr. D. C. G. Wright, a Magister pilot.

Mr. B. G. Lamb, an Auster V passenger, did not quite have the right idea about the comments competition but his "Where can I get 10,000 francs for nothing?" qualified for an immediate prize for supreme confidence in French generosity. Reports that the prize was in fact 10,000 francs have not been confirmed.

From the Royal Hotel the guests each night made for the Ambassadeurs Restaurant at the Casino, for prize-giving, dinner and Gala Ball.

There were several innovations this year, for example, a coincident visit, by air charter, of a group of British M.Ps. who played golf and tennis matches and, like the Royal Aero Club team, were defeated by their French opponents. There was also a cabaret at the Ambassadeurs, in which Sir Frederick Handley Page assisted as conjurer's mate. At midnight the traditional rain of fire outside the great windows at the end of the ballroom startled newcomers with its brilliance and changing colours and reminded all old hands of its many previous manifestations, now inseparable in their minds from the playing of the Barcarolle by one of the two bands.

So retiring are the French reception committee that it is probable that many of their guests know them only by sight. For the same reason, few of the British aviators had the pleasure of meeting Monsieur Jacques Allez, President of the Aero-Club de France, who, this time, made it his job to encourage the golfers rather than to play.

Thanks were expressed for the guests by Mr. Kenneth Davies. The reply on behalf of Monsieur André was made by the Mayor of Deauville, Monsieur Fossorier. Translations of the prize-winning comments and announcements were by Duke Fitz-James.

Monday morning brought a marked contrast in weather. England's weekend thunderstorms had moved to the French coast —forming a formidable barrier of low cloud and poor visibility for those planning home flights *via* Dieppe, Le Touquet and the short Channel crossing. Some reached base by the late evening after braving the elements or flying behind the weather *via* Cherbourg and the Isle of Wight; others waited until Thursday. Only for very few were the extra hours in Deauville a hardship.

Scene from the official timing booth atop the grandstand at the 1946 National Air Races, Cleveland, Ohio.

History of the Pulitzer and National Air Races, 1920-1955

By PETER M. H. LEWIS*

AIR RACING in the U.S.A. PART I

AIR racing had been a public attraction in America before the First World War—as in England and France—and after the war ended it was not long before meetings began to be organized again. Among the first post-war races were those from New York to Toronto in 1919, and the 1920 Transcontinental. The competing machines were ex-Service aircraft bought from the War Surplus Disposal Boards, for some time was to elapse before commercial production started.

The first encouragement of entries came in 1920 with the presentation of a trophy by Herbert, Joseph and Ralph Pulitzer for competition between Service pilots. The prize was for the highest average speed over a closed-course distance of 155 miles, made up of five laps of 31 miles. The race was held on November 25 at Mitchell Field, Long Island, New York, Capt. Corliss C. Moseley winning for the Army on the 600 h.p. Packard-powered Verville biplane at 178 m.p.h. During the year a few civilian meetings were held in widely scattered parts of the country, without any attempt at centralized control, as no body existed for the purpose.

Increasing enthusiasm showed itself the next year with the formation of the Detroit Aviation Society to run a series of races from September 8 to 10, 1921, at Selfridge Field, Michigan. Four events, with a prize list of $10,000, were scheduled to include the *Detroit News* Aerial Mail and the Aviation Country Club of Detroit Trophy Races, and the second contest for the Pulitzer. In July, the Army and the Navy withdrew, giving "a lack of funds" as the cause. Faced with the prospect of receiving no entries, the Society was forced to postpone the show until the following year.

Kansas City, from October 31 until November 2, was the scene for the American Legion meeting, a highlight of which was an ascent by Lt. Wendell Brookley to 24,850ft in a D.H.4B, his passenger, Sgt. Encil Chambers, then parachuting to the crowd below. C. S. ("Casey") Jones, in the next few years to become an inveterate race winner, came first in the Legion Junior Derby with his C-6 Curtiss Oriole at 97.3 m.p.h.

The next few days, November 3 to 5, had been set aside for the International Aero Congress at Omaha, Nebraska, and the 1921 Pulitzer was flown there on the first day with civilian pilots in the cockpits, the aircraft being entered by their respective manufacturers. Bert Acosta flew the course at 176.7 m.p.h. with the Curtiss Navy Racer, beating Clarence Coombs in the same firm's Cactus Kitten Triplane. The latter aircraft had been converted from the Texas Wildcat Monoplane of the previous year, and the race was an exciting duel between the two. Some of the competitors on the field had flown in from the Kansas City meeting and the races are generally considered to have formed the basis for the later Nationals. Competition to gain the maximum performance from their aircraft, apart from high speed, was provided for the owners by the Larsen Trophy for efficiency.

The next step towards control of the increasing number of meetings being arranged in widely separated states was seen at the beginning of 1922. The National Air Association announced in January that later in the year it would amalgamate with the Aero Club of America with the object of conducting all races. The new body was to be named the National Aeronautic Association, and it was to come into being during the Detroit Aviation Meeting in October. During these early days, civilian flyers had a hard time vying with the dashing Army and Navy special events for the public's applause. To attract notice they resorted to wing-walking stunts and climbing from one aircraft to another in flight, until such sensational activities were banned in June.

The Detroit meeting was duly held at Selfridge Field from October 8 to 14 under the direction of the Detroit Aviation Society. Six main closed-course contests were on the programme and an innovation was the first of the "on to" races, for civilians only. These were to become very popular following the initial seven entries, who were required to start from any point that they chose more than 200 miles from the finish at Detroit, the aircraft with the highest average speed being declared the winner. Walter H. Beech flew his Laird Swallow 810 miles from Kansas City to first place.

Twenty-two Pulitzer starters, the highest number during the series, raced for the prize, which went to Lt. R. L. Maugham of the Army, who flew his Curtiss R-6 at 206 m.p.h. over the 155 miles. Army pursuit pilots had their own race for the John L. Mitchell Trophy presented by Gen. William Mitchell in memory of his brother killed during the late war. It was run over a 200 km course, the honour of being the first to receive the award going to Lt. D. F. Stace with his Thomas Morse MB-3. The crews of the two-seater observation aircraft were catered for by the prize from the Liberty engine builders, while the Navy raced for the Curtiss Marine Flying Trophy.

Letters were being flown at the time by the U.S. Air Service in Liberty D.H.4s, and the *Detroit News* offered its Air Mail Trophy with the stipulation that it should be competed for by multi-engined aeroplanes. This rather odd requirement meant that the twelve single-engined mailplanes available could not compete and the event was contested by four Martin Bombers and one Martin Transport over 240 miles. Lt. E. H. Nelson flew the Transport into first place at 105 m.p.h. The other racing event on the programme was for an annual trophy donated by the Aviation Country Club of Detroit. It remained a feature for the next seven years; the first recipient was Lt. H. R. Harris, flying the D.H. *Honeymoon Express* at a creditable 135 m.p.h. And so the first co-ordinated series of races finished. Although Service pilots won all the closed-course contests, public interest was being roused; and, with nearly five years of peace behind them, manufacturers sensed this growing enthusiasm and planned to cater for it.

The year 1923 brought the newly formed N.A.A. its first chance to put its long-prepared ideas into being. The races were to be held this year at Bridgetown Airport, St. Louis, Mo., from October 1 to 3, with the help of the St. Louis Air Board and the Flying Club of St. Louis. The show was advertised as the

A Pulitzer Race entry in 1920 and 1922 was this Packard-engined Verville. Piloted by Capt. Corliss Moseley, it was victorious in 1920.

* *The author wishes to acknowledge assistance given by Messrs. C. S. Logsdon, director of the contest division, National Aeronautic Association; Benjamin T. Franklin, general manager, National Aircraft Show; and W. A. Mara, director of advertising and publicity, Bendix Aviation Corporation.*

Reading down, the aircraft on the left are the Wright F-2W, a 1923 entry in the Pulitzer Race; the Gee-Bee R-1, winner of the 1932 Thompson event (pilot, Jimmy Doolittle); and the Wedell Williams, which was victorious in the 1934 Thompson Race.

AIR RACING IN THE U.S.A. . . .

International Air Races. The St. Louis Aeronautical Corporation was formed to build the airport, the finance being found by issuing 20,000 shares at $10. Bad weather made it necessary to postpone the meeting for three days, by which time the water-logged field was just serviceable. The "On to St. Louis" race started on September 20 to allow the twenty-seven contestants to reach their destination before the main events. The best speed was put up by "Casey" Jones, the president of Curtiss Flying Services, who chose to fly the 900 miles from Garden City in an OX-5-powered Oriole. This same combination was to become familiar as a consistent race winner in future years. Civilian participation in the races was encouraged by making non-Service entry possible in five out of the eight events.

Fifteen airmail D.H.4s were entered under new rules to fly for the *Detroit News* Trophy. The donors wished civilians also to take part in the contest, but the regular Service pilots refused to fly against them. A number of civilians were, however, included in the field for the Liberty Engine Builders' Trophy; but the Army won, its Fokker CO-4 averaging 139.03 m.p.h. over six laps of 50 km. The winner of the trophy presented by the Merchants' Exchange of St. Louis was a Martin Bomber which, before its conversion from a transport, had flown 120,000 miles on the mail routes since 1919. A civilian, Jack Atkinson, flew his Bellanca C. F. Sedan to carry off the Detroit Aviation Country Club handicap award, and the MB-3s of the 1st Pursuit Group circled the course in the John L. Mitchell contest.

The fourth race for the now well-established Pulitzer Trophy was run under modified rules to take into account the higher speeds, which were beginning to affect pilots in high-g turns. It was now the Navy's turn to win; Ensign Alford J. Williams, later to achieve fame as an exhibition pilot and representative of the Gulf Refining Company, recorded a considerable increase over the previous year's speed in his Curtiss R2C-1 at 243.67 m.p.h. for four laps. All the Navy's entries—two Curtiss and two Wright Racers—were new, but the Army used the two R-6s flown in the previous year by Maugham and Maitland.

The organizers were not without thought for the younger enthusiasts, and a model flying event was included in which they could show their skill.

Wilbur Wright Field, at Dayton, Ohio, was chosen as the venue for the 1924 National Air Races from October 2 to 4, with the "On to Dayton" event to take place between September 29 and October 1. "Casey" Jones in his Oriole again carried away this prize this time from the fifty-one other entries. Eleven events were on the programme; of these, seven were open to civilians—two more than in 1923. The reliable Curtiss OX-5 gave its 90 h.p. to most of the private-owner types until a wider selection of powerplants became available.

This year the light-aircraft enthusiasts were able to compete for a trophy given by the *Dayton Daily News* (it was won by the Driggs-Johnson Jimmie) and another by the Boston Bicycle Club and Engineers, this going to H. C. Mummert's Sport. The light aircraft used converted motor cycle engines, which could not be called very reliable; but some good airframe designs were seen.

Lt. H. H. Mills came first in the Pulitzer in the Verville-Sperry entered by the Army. His speed of 215.72 m.p.h. was considerably lower than that of the Navy the year before. A fatal accident occurred when Capt. Burt E. Skeel, the winner of the 1923 Mitchell, crashed at the start.

The 1924 Mitchell participants all flew D-12-powered Curtiss PW-8 Pursuits, and Lt. Cyrus K. Bettis came first at 175.45 m.p.h. Regular Air Mail Service pilots again flew in the *Detroit News* event and the Liberty Engine award was there for the observation crews and also for civilians. Other prizes for 1924 were donated by the National Cash Register Company, Dayton's Central Labour Union and the Dayton Chamber of Commerce, the last-named for Service aircraft carrying a 2,000 lb payload over 150 miles.

The following year, 1925, was one of great importance in the history of the Nationals. The N.A.A. was by now a body of significance in the scheme of American aviation, and the 1925 competitions were the last to be staged on a military airfield under Service supervision. The year was also of note as that in which the last race for this trophy was run, and the spectators at Mitchell Field from October 8 to 12 seeing a final victory for the Army by the winner of the 1924 Mitchell, Lt. C. K. Bettis, in a Curtiss R3C-1 at 241.695 m.p.h. after four laps of an exciting contest with Al Williams.

The Pulitzer was abandoned by the Army and the Navy because it was found impossible to allocate sufficient money for the special aircraft needed. The races had, however, served admirably in developing advanced "pursuit ships" and the experience gained was built into the new fighters being designed for the Services in the mid-1920s.

New rules were announced for the air-mail event, in which the prize was to be known as the *Detroit News* Air Transport Trophy. As private companies were now accepted as mail carriers, they also were eligible to enter. Another annual prize had its title changed, this time to the unwieldy name "Aviation Town and Country Club of Detroit Trophy." "Casey" Jones and his Oriole won it, as well as the prize presented by the Merchants' Association of New York for carrying 340 lb payload for 100 miles.

The year was notable also for its first foreign entries. Although international participation had been invited in the past, no such entries were received until 1925, when two French Army Bréguet 19s presented themselves for the Liberty Engine Builders' race (military aircraft only). One of them, flown by Capt. Henri Lemaitre, beat the native opposition and succeeded in winning the trophy for France.

Events previously open to both Service and civilian flyers were now separated, so that each had their own contests.

The year's Mitchell race went to Lt. T. K. Matthews in a PW-8. The "on to" event was included again in the programme. Ken W. Montee in his Montee Special biplane was the winner, flying from Santa Monica to New York, his reward being the New York Chapter of the N.A.A. Trophy. The 1925 programme showed many innovations, especially in spectator appeal; there was refueling in the air, balloon-bursting, sky-writing, parachuting, a battle between National Guard aircraft and Army tanks, and other various supporting features.

From a small series of Service races with civilians playing a minor but slowly growing part, the Nationals had changed their character completely. They were now organized by a civil group for the entertainment of the public. High speed and dash, however, were still provided by some all-Service events, five out of the nineteen competitions being set aside for them in 1926, with one of the five for the National Guard. The Nationals were staged at Philadelphia from September 4 to 11, concurrently with the Sesqui-Centennial Exposition celebrating the 150th Anniversary of the Declaration of Independence. Commercial firms were quick to see the future business to be gained by presenting trophies and awards to swell the prize list, making it larger than ever.

The Kansas City Rotary Club Trophy was donated, in place of the Pulitzer, to promote high-speed rivalry between the Army, Navy and Marines. Bad weather prevailed, but Lt. C. D. Cuddihy managed 180.495 m.p.h. to win. The "On to the Sesqui" race brought the Aero Club of Pennsylvania Trophy to Fred D. Hoyt for covering 2,558 miles from Eureka, Cal., in 31 hours with his

On the right, reading down, are the Wittman "Chief Oshkosh" of 1935; the Howard DGA-6 "Mr. Mulligan," winner of the 1935 Bendix Race; and the Rider-Clark R-3, a Bendix entry in 1935.

Travel Air. The indomitable "Casey" Jones was once more among the prize-winners in his faithful but now ageing Oriole; and the Mitchell Trophy went to the Army's R-1, with Lt. L. G. Elliott in the cockpit.

Curtiss Jennies still formed the equipment of the Reserve, and eleven National Guard pilots from Maryland, New York and Pennsylvania units heroically raced their ancient mounts for the crowds for the last time. Ultra-light enthusiasts received plenty of opportunity to display their talents in three special events, and regular contests of previous years made up the rest of the attractions, interspersed with specialities.

In 1927 the Nationals moved West, so that the thrills of air racing could be brought to a new audience. The show was at Felts Field, Spokane, Washington, on September 23-24. The programme was planned by the Air Derby Association of Spokane and the N.A.A. to demonstrate improved aircraft performance, and it brought in new rules.

The old "on to" races were abolished and high speed cross-country "Derbies" substituted, with separate classes. Starting on September 19, "A" and "B" National Air Derbies were from Roosevelt Field, New York, and from Mills Field, Santa Anna, Cal. To make the best use of the horsepower available, most of the events were divided into engine classifications instead of aircraft types. Interest in the lightplanes was disappointing, E. B. Heath's Parasol being the sole entry in both sections. Greater Service participation was seen, six out of the twelve events, apart from the Derbies, being for military aircraft.

For the first time, a non-stop transcontinental Derby from New York to Spokane was scheduled. Three entries were received but only two succeeded in getting airborne with their heavy fuel loads. These were Eddie Stinson and Fred Koehler, in a Stinson Detroiter —they retired at Missoula, Montana—and C. A. ("Duke") Schiller and Edward Bohn in the *Royal Windsor* of the same type; they had to land at Billings, Montana. The Air King biplane made two false starts and gave up at the Roosevelt Field starting point.

A Douglas transport disgorged nine parachutists in 18 seconds as a supporting item at the Spokane meeting—which, incidentally, was the first of the series to make a profit. Aircraft design trends still showed the biplane to be predominating. The National Guard, their Jennies gone, were at last able to show new equipment in their Douglas O-2s.

The West Coast retained the Nationals for the second year running, when they were held over nine days from September 8 to 16 at Mines Field concurrently with the 1928 Los Angeles Aeronautical Exposition. In keeping with the growth of commercial flying in the country the programme was the most ambitious to date and the Services grasped the opportunity to display their new aircraft in eleven out of the eighteen closed-course events. The Navy contingent was particularly strong; their Seahawks aerobatted alongside the Army's Three Musketeers, while all three Services showed their bombing and attack squadrons.

Six Derbies were run, from New York, San Francisco and Oakland, with an international class from Windsor, Ont. The non-stop transcontinental event from New York was a failure for the second time, bad weather bringing down the two entrants before the finish.

The Mitchell trophy was again included, after a year's absence, but the Army withdrew from the Liberty Engine Builders' contest, leaving the field free for the Navy. Something new in lightplanes was the Heath Baby Bullet, the first home-built racing special to appear. The races and supporting programme were watched by 400,000 spectators.

Public enthusiasm for flying was high; but it was noticed, nevertheless, that for some months afterwards people seemed to lose confidence in air travel, and then regained it. This was despite careful planning by the N.A.A., and such propaganda items as a parade of nine Ford Trimotors and fifteen Ryan Broughams. One reaction among the competitors was that the Derbies should be confined to stock commercial aircraft, with a separate section for experimental racing specials.

In 1929 it was the turn of the East; Cleveland, Ohio, was the home of the Nationals from August 24 to September 2. The programme showed a decline in Service events, only six out of the total of twenty-six closed-course contests being thus restricted, while four of the remainder were confined to women, who also had their own Derby from Santa Monica. Women's flying licences now totalled more than one hundred.

The races were planned to present the best possible show to the public while also enabling manufacturers to enter various design classes in which they could assess the performance of their products in competition with other makes. A new kind of elimination race, the Australian Pursuit Handicap, was also introduced, in which an aircraft had to retire as soon as it was passed.

The 1929 Nationals were notable in several other ways. For the first time, the non-stop Coast-to-Coast from Los Angeles was successful as a race, being won by Henry J. Brown in his Hornet-powered Lockheed Air Express at 156.2 m.p.h. Seven other Derbies, run from widely separated points, included the international event from Toronto. The year 1929 was also remembered for the donation by Thompson Products, Cleveland, of a trophy for a free-for-all civilian race over 50 miles—and for the fact that the Travel Air Mystery S flown by Douglas Davis won it at 194 m.p.h., thus becoming the first civilian machine to exceed the speed of military aircraft at the races. The Cierva 19 Mk 2 gave the first public Autogiro demonstration seen in the U.S.A.

In spite of the general feeling that 26 field events and numerous Derbies were more than were necessary, the programme for 1930 emerged with no fewer than 40 closed-course contests and six Derbies. The mammoth spectacle was spread over nine days from August 23 to September 1, the Middle West acting as host at Curtiss-Reynolds Airport, Chicago. Service participation was still further reduced, with only five events.

The race for the Thompson Trophy, now an annual event, was of note as the only event won by a biplane, C. W. Holman's oddly named Laird Solution (built during the three weeks before the race and test-flown for ten minutes!). It was also the first closed-course civilian race to be won at an average speed of over 200 m.p.h. and the only Thompson in which a Service aircraft took part; this was the Curtiss XF6C-6 Navy Racer, which killed its pilot, Capt. Arthur Page.

Spectators were given a better view of the proceedings by the provision of racing pits before the stands, where they were able to note such refinements of design as the use of N.A.C.A. and Townend cowlings.

Wiley Post beat three other Lockheed Vegas to win the non-stop transcontinental Derby from Los Angeles in *Winnie Mae*. Many of the best pilots from abroad displayed their talents. Balloon bursting, aerobatics, gliders, parachuting and other diversions filled the rest of the bill.

Next year, 1931, the races returned to Cleveland and were staged from August 29 until September 7. A new prize was added by Vincent Bendix, who presented his annual trophy for long-distance cross-country racing, stops being allowed. The first recipient was Jimmy Doolittle in the Laird Super Solution, starting from Los Angeles. He continued to Newark, N.J., to break the West-to-East record. The Thompson went to Lowell Bayles in the Gee-Bee Z, which won with an increase in speed of 35 m.p.h. over that of the 1930 winner.

Transcontinental Derbies were still popular, but it was noticeable that in the Bendix nearly all the entries were large commercial aircraft with the necessary range; an exception was the winning Laird, which—alone among them—was a biplane. Design showed a cleaning-up, with the use of increased power, retractable undercarriages and the deletion of struts and wires. At the 1931 meeting the airship *Akron* put in an appearance, and 36 Army and 36 Navy aircraft included 12 flying-boats. Racing pits were again a feature.

The races stayed at Cleveland for 1932 and were held from

The Folkerts "Toots," placed fourth in the 1936 Thompson Race.

AIR RACING IN THE U.S.A. . . .

August 27 to September 5. They are mainly remembered for Jimmy Doolittle's winning of the Thompson in the new Gee-Bee R-1, second, third and fourth places going to the Wedell-Williams racers, and for the competition between the Gee-Bees and the latter machines. Jimmy Haizlip, in one of the Wedell-Williams, won the Bendix with two others from the same stable in second and third places. The long-range Gee-Bee R-2 came fourth. Sufficient range had now been built into the small specials for long-distance flying, and controllable-pitch airscrews were of great help in take-off with heavy loads of fuel.

In 1932 the Derbies were still a part of the programme, but by 1933 they had been dropped in favour of the single Bendix race. The West Coast took over from July 1 to 4, with the Bendix and the Thompson as the two star attractions at Los Angeles. Both Gee-Bees had mishaps and the Wedell-Williams had the field to themselves, taking the Bendix and Thompson Trophies and another rejoicing in the name of Cleveland Pneumatic Aerol Women's Speed Dash Trophy. They also won the two "1,000 cu in" events.

Shell Petroleum sponsored many of the new events arranged for racers with 375 and 550 cu in engines. A new crop of small, specially built "hot-rods" appeared in response to these awards, from designers Benny Howard, Art Chester, Lawrence Brown, Steve Wittman and Keith Rider.

The 550 cu in racers were given a further boost by the addition of the annual Louis W. Greve Trophy to the prize-list for the 1934 Nationals, held in the East again, at Cleveland, from August 31 to September 3. The award was based on points gained in three 50-mile closed-course races and was won by Lee Miles on the Miles and Attwood Special with a first, a second and a third.

The Bendix received scant support with three entries only, two of which crossed the finishing line. Many pilots who would have been expected to enter were busy preparing themselves for the England-to-Australia race, due to be held a few weeks later. The Bendix had been won by a Wedell-Williams for three years in succession and the Thompson for the last two years. At the express wish of the pilots, the Thompson course was altered from five miles to eight-and-one-third miles. In that year the races showed a profit of $45,000.

Some 200,000 spectators turned up at Cleveland for the 1935 Nationals, from August 30 to September 2 and saw Ben Howard's aircraft gain the three principal awards. The all-white *Mr. Mulligan* won both the Bendix and the Thompson, and three first places gave *Mike* the Greve award. Only 24 seconds prevented Roscoe Turner from coming first in the Bendix and he also narrowly missed the Thompson Trophy. *Mr. Mulligan* was a commercial type of cabin machine and was produced later in a modified form for the private owner.

At this period the races showed few new developments in design; flaps and retractable undercarriages were not popular features. The Thompson speed, in particular, was the slowest since 1930 and third, fourth and fifth Bendix places were taken by large commercial aircraft. The supporting programme included the Amelia Earhart Women's Trophy, the Ruth Chatterton Sportsman Pilots' Derby, a descent by "birdman" Clem Sohn, crazy flying by Al Williams and others, and the usual parachuting and Service events.

A return to the West Coast was made the following year, from September 4 to 7, 1936. Several surprises were seen, among them France's winning of the Thompson and Greve events by Michel Detroyat's blue Caudron 460 the engine of which was changed to meet the rules for the two races.

For the first time the Bendix was won by a woman, Louise Thaden with Blanche Noyes covering the 2,600 miles from New York in their Beechcraft C-17R in three hours under the 18-hour limit. The finishers in this classic were all commercial aircraft.

The Greve was changed to a single 100-mile race, and the year was marked by a number of crashes. The home-builders had been busy during the past year and the Californian sky was filled with the snarl of numerous new Specials. Menasco engines powered all of the Greve entries except the winning Bengali-Caudron.

The 1937 Nationals went back to Cleveland, with the programme for September 3-6 much the same as that of the year before. Frank Fuller flew a Seversky S-2 version of the P-35 pursuit to win the Bendix at a new record speed of 258.242 m.p.h. and continued on to Bendix, N.J., to set a new West-to-East time of 9 hr 35 min. Several well-known flyers failed to take off.

Clayton Folkerts saw Rudy Kling win both the Thompson and Greve Trophies in his latest (Folkert's) design. The Miles and Attwood Special came to grief and killed Lee Miles. Count Hagenburg crashed in a spectacular way from four feet in inverted flight—and walked out of the wreck. Hair-raising events billed were a 12,000ft inverted power-dive and "human bat" Buddy Betzel in a 10,000ft "death-defying glide."

The Nationals stayed in the East again from September 3 to 5, 1938, at Cleveland. New rules were that Bendix racers had to carry radio and navigation aids and could not fly in other events, although the pilots could do so. The prize money was up by 25 per cent. The Bendix resulted in a second win for a woman when Jacqueline Cochran flew in with her Seversky P-35 from Glendale, averaging 249.774 m.p.h. through bad weather.

Out of the eight Thompson finalists from the 200 m.p.h. qualifying heats, Roscoe Turner won the award for the second time, racing round the pylons for 300 miles at 283.419 m.p.h. The 200-miles Greve race went to Tony LeVier with a speed of just on 250 m.p.h. in the *Firecracker*.

Service participation consisted of eighteen each of Army Severskys from Selfridge Field, Navy Grummans from U.S.S. *Yorktown* and Marine Grummans from Quantico, Va. German test pilot Hanna Reitsch, at that time 25 years old, performed sailplane aerobatics and Emil Kropf showed the Fieseler Storch's slow-flying qualities to the 73,000 spectators. It was again noticeable that most of the lower-powered aircraft used Menasco engines.

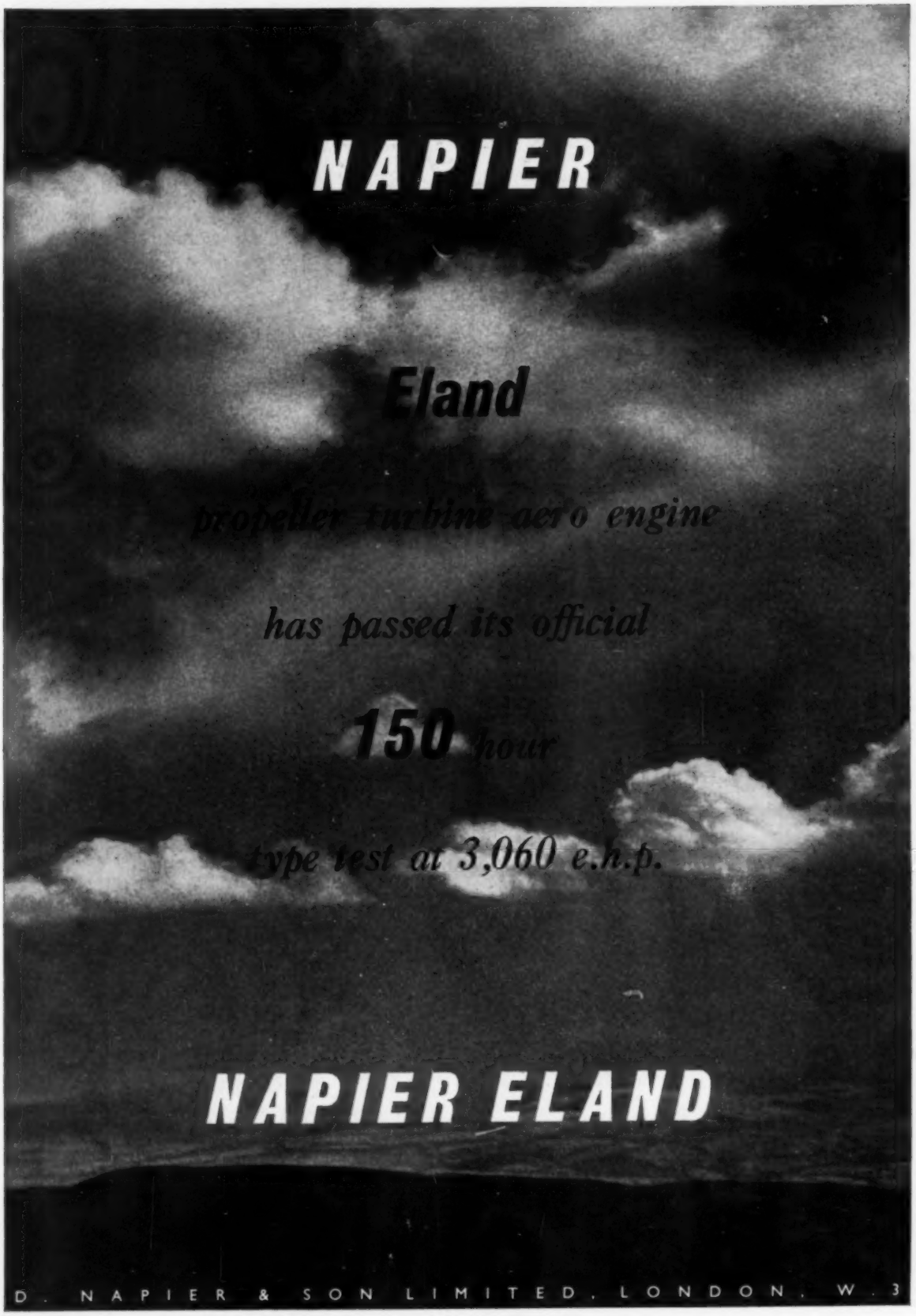
World events were moving swiftly towards a new war, and the 1939 Nationals were held from September 2 to 4, over the weekend during which the conflagration finally broke out in Europe. The usual classic events were on the Cleveland programme. Frank Fuller raced from Burbank, Cal., to win his second Bendix in the Seversky S-2. Roscoe Turner received the Thompson Trophy for the third time and announced that he was retiring from closed-course racing. Two other pilots, Earl Ortman and Marion McKeen, decided that it was also to be their last season. The ten-mile Thompson course was used for the Greve, Art Chester's *Goon* going on to win alone after the opposition had retired from the race.

Miss Los Angeles crashed at the start, killing Lee Williams, and Delbert Bush had a fatal accident in the Folkerts Special, thereby adding two more names to the long list of air racing deaths, which had included a score of popular pilots. Several other regular competitors had died in non-racing crashes.

Air racing itself was, by 1939, in danger of becoming extinct. The reason was that the cost of building such advanced aircraft with yearly new refinements was being found well-nigh insupportable by the air-racing fraternity. Government and company assistance was not forthcoming and it looked as though the races were at an end, especially after the resignation of the Hendersons who had been in charge for the last eleven years.

(To be continued)

The uppermost machine on the right is the Laird-Turner L-RT, winner of the 1938 and 1939 Thompson Trophy Races. The second machine is the Marcoux-Bromberg.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A HORSE CALLED GENTLY

Oh what a prob-lem was little GENTLY. So slow. All the other Little Horses used to laugh at poor GENTLY. "Oh, you old slow-coach" they cried rude-ly "can't do more than 2 or 300 r.p.m." Poor GENTLY was so sad. Until one day the Master (the old goat!) set them all to drill-ing holes in Tit-an-ium. All the Little Horses set to work at a great pace but soon they were so hot and ill-tempered and began to cry "This is too hard for us". All but little GENTLY. He was quiet-ly work-ing away at just 165 r.p.m., cut-ting his way through the hard metal with no trouble at all. "See boys" said the Master in that sancti-mon-ious voice — "GENTLY DOES IT."

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GEC373

Seeing for themselves are (above, left) a group of Belgian officers who were among recent NATO visitors to the English Electric Co., Ltd., guided weapons division at Luton and Stevenage, and (on the right above) A.V-M. G. W. Tuttle, Deputy Chief of Air Staff, who visited the Avro factories at Woodford and Chadderton. The Belgian group was led by Major General (Aviation) Rolleghem. With A.V-M. Tuttle are (left to right) Sir Roy Dobson (managing director, A. V. Roe), Mr. A. S. Bennell (the A.V-M.'s private secretary) and Mr. J. R. Ewans (Avro chief designer). Avro's superintendent of flying, W/C. R. J. Falk, can be seen behind A.V-M. Tuttle.

THE INDUSTRY

Rolls-Royce Tribute

THE directors of Rolls-Royce, Ltd., have made a payment of £23,000 to Mr. A. G. Elliott, who retired as executive vice-chairman of the company just over five months ago, at the age of 66, after being with Rolls-Royce since 1912. He was responsible, under Royce, for the original designs of Rolls-Royce "R" engines which in Vickers Supermarine S6s won the the Schneider Trophy outright for Britain, and was in charge of the design team responsible for producing the Merlin. The directors' report said the Board wished to record its appreciation of Mr. Elliott's "invaluable services."

Dalic Plating

THE problem of local repair to protective plating on large components has previously not been easy to solve—short of stripping the component and re-finishing. The Dalic brush plating process offers a more practical solution whereby re-protection can be effected *in situ*, if necessary, with consequent considerable economies in man-hours spent in dismantling and reassembling.

The Dalic process equipment, marketed in England by Metachemical Processes, Ltd., is a development of an idea of French origin, and is a "brush-plating" technique. The equipment consists of an A.C. mains transformer-rectifier giving a virtually ripple-free D.C. output of a reduced but determinable voltage and a maximum current of 40 amps. A cathode connection is clamped to the workpiece, and the annode is a pure graphite rod contained within an insulated holder. The rod is wrapped in a cotton wool shroud by the operator, and the resultant brush is known as a "tampon". The localized finish is deposited onto the cleaned workpiece by dipping the tampon into a solution of the metal finish. Some nineteen different elements have been used and the solutions are non-injurious to the operator's hands.

The efficiency of this method over bath-plating small areas of large components has resulted in its adoption for the plating of airscrew blade spindles, where these are in close proximity to hard rubber which would be difficult to protect if the blade were completely immersed. More typical of Dalic application as visualized by Metachemical Processes is the touching-up of airscrew blade plating which has been eroded by flying stones. Hamilton Standard of America have ordered Dalic equipment in quantity—initial hardware and a regular supply of solution (the strength of which is chemist-controlled at the factory)—as a standard repair procedure.

It is emphasized that although Dalic is a very rapid process—local plating of 0.001in cadmium requiring about 25 seconds—it is supplementary to bath-plating in the sense that it is a tool which can be used by an operator with a minimum of training and no chemical knowledge. The operator requires only to consult a table showing divisions of the amp-minute scale for a given thickness of coating. Indeed, the possibilities of coupling to 24 volt aircraft batteries make it a useful field-service tool.

A further application for touch-on plating is to be found in the restoration of generator armature shafts where these have suffered from fret-corrosion under ball bearings. In the ordinary way, plating of the shaft by immersion is difficult and tedious due to the necessity of protecting the windings from the electrolyte, followed by a long storage period to ensure that no damage has occurred. The brush plating technique (which has been adopted by B.O.A.C., B.E.A. and other European airlines) is to mount the armature in a lathe and if necessary skim the shaft true, although the process will accommodate slight irregularities. This is followed by cleaning with a tampon dipped into the Dalic alkaline cleaner, during which time the workpiece is made the annode. When the cleaner has been wiped off with cold water, the shaft is ready for the deposit, which is applied with another tampon covered in clean wool and dipped into the nickel or tin solution electrolyte, although on occasion a drip-feed may be used. Speed of rotation, current and voltage are controlled according to a factory-prepared table. The re-plated shaft requires no further machining, and by time-control can be finished quite easily to limits of 0.0001in.

Hand-plating in this manner results in a deposit of high quality. The brushing action of the tampon on the cathodic workpiece acts as an oxide scour which ensures good adhesion, and by wiping off hydrogen bubbles as they form, reduces porosity and overcomes embrittlement difficulties. Of particular interest are the results of Wohler fatigue tests on S.96 material plated with 0.0001in zinc. The loss in fatigue strength with acid zinc plating was 15 per cent; with cyanide zinc plating 8.9 per cent; and with brush plating 5.1 per cent.

Other applications where selective stopping-off on shafts, splines and bores has to be done are legion, and the Dalic process should prove a useful tool in shops where a quantity of salvage, maintenance or repair work has to be done.

Versatile Veneer

APPLICATIONS to the interiors of V.I.P. aircraft and to the more luxurious classes of transport machine are proposed for Flexwood, supplied in Great Britain by the Alexandria Trading Corporation, Ltd., of 121 London Wall, E.C.2. The first aircraft installation was on Mr. Loel Guinness' DC-3 some months ago.

Flexwood is a wood veneer, bonded by heat and pressure to rubberized cloth. The resultant material undergoes a flexing process which is said to break up the molecular structure of the wood without in any way detracting from its texture and appearance. This process imparts extraordinary pliability; thus Flexwood can be used not only for straight walls, but for curved surfaces and for coves and cornices. The additional strength of the cloth backing makes it possible to use wood much thinner than a normal veneer and the weight penalty is extremely low.

IN BRIEF

We regret to record the death, on July 5, of P. J. Taylor, A.F.R.Ae.S., of Green Lane, Hanwell, London, W.7. Mr. Taylor had been connected with the design side of aircraft from about 1922, when he joined the staff of A. V. Roe, Ltd., at Hamble.

* * *

Mr. A. K. Jordan, assistant general sales manager, has left the Northern Aluminium Co., Ltd., to become general sales manager for the Aluminum Co. of Canada, Ltd. (Alcan). He is succeeded by Mr. J. H. Mayes.

* * *

The Hawker Siddeley Nuclear Power Co. has established permanent headquarters in part of the Hawker premises at Langley airfield, Bucks. Mr. E. P. Hawthorne, chief executive, has already moved there and plans are being made to establish laboratories for research into reactor systems.

* * *

Mr. Eric Sanders has relinquished his appointment as managing director of Helliwells, Ltd., Birmingham, 26, because of heavy personal commitments. Mr. G. Taylor Powell, director and general manager of the company's Midland factories since 1949, now assumes responsibility for the aircraft division. Mr. Powell's office is at Elmdon airport.

CORRESPONDENCE

The Editor of "Flight" is not necessarily in agreement with the views expressed by correspondents in these columns; the names and addresses of writers, not for publication in detail, must in all cases accompany letters.

Nonagenarian "G for George" at Canberra in 1954. (See Mr. Walker's letter below.)

Air Traffic Control

THE recent Grand Canyon accident clearly indicates a bad situation in air traffic control. In areas with dense traffic, especially, control is far from sufficient. This disaster was one of those which perhaps was bound to occur, and one can say it is a miracle that it didn't occur earlier when one remembers that in the United States there are on the average four "near misses" each day. The situation will become even worse with the introduction of jet transports, with their higher speeds.

Air traffic control—and this is true not only for the States but for Europe as well, where some narrow escapes have occurred during recent months—must be made very much more efficient, perhaps by extensive use of radar. Extreme care should be given to let-down areas. When the jet transports come on the scene there should be much thought about height separation, especially when two planes fly close together.

But it must also be made possible for the pilot to detect approaching aeroplanes. The cockpit windows of most transports today are so small that one almost cannot see an approaching aircraft. The weather radar which at last is beginning to be installed into commercial aircraft in some numbers should give the pilot the chance of detecting all aircraft dangerously near him, but I understand that not all versions of weather radar permit the sighting of such small objects as aircraft appear. I hope this form of radar will soon be superseded by more suitable sets.

May this deplorable accident prove an incentive for new developments in air traffic control. They have been overdue for some time.

Schondorf/Ammersee, Germany. HANS H. SCHICHT.

Boeing Sweepback

I WONDER how many readers noticed an interesting optical illusion in the photograph of the Boeing 707 on page 11 of *Flight* for July 6?

This photo, taken from underneath and some way ahead of the aircraft, shows it coming in to land with "everything down." What is interesting is that the tailplane appears to have no sweepback at all, either on the leading or the trailing edge, whereas, as is well known, the tailplane has a considerable angle of sweepback on both leading and trailing edges.

The explanation for this apparent lack of sweepback is presumably that the variable-incidence tailplane is right down, i.e. at its most negative angle of attack. Even so, the almost total lack of sweepback visible is rather extraordinary.

Rustington, Sussex. M. J. HARDY
(Associate Editor, *The Airport Visitor.*)

[The apparent lack of sweepback is caused, not by the angle of incidence, but by the considerable dihedral of this surface.—Ed.]

Australia's Historic Lancaster

I AM sorry that my reference to "G for George" (in *Flight* for February 3) underestimated the number of missions flown by the old veteran. However, having been corrected twice by correspondents who themselves appear to be in some doubt as to the number of missions the aircraft actually did fly, I have stirred myself sufficiently to delve into my colour slides and produce one taken on Air Force Day 1954 at Fairburn Aerodrome (R.A.A.F. Station, Canberra) which shows George's nose and chest; said chest proudly wearing 90 bombs, the 1939/45, Germany and, I think, Air Crew Star Ribbons. The 90 bombs are the obvious indication of 90 missions.

You will also note that George appears to be in excellent "nick"—so good, in fact, that the old ship was taxied into position in the display hangar on its own engines, disdaining the assistance of a tractor, and the pilot who took him (despite the normal feminine gender for all ships, "George" must surely be masculine) told me that if he could have wheedled 50 gallons of juice out of the "old man" he would have done a couple of circuits "just for the hell of it!"

Sutton Coldfield, Warwicks. H. N. WALKER.

The Size of an Airline

I WONDER whether Sir George Pirie's argument (*Flight*, July 13, page 102) that there is a relationship between an airline's route-mileage and its efficiency is soundly based? "Studies of a large number of airlines," he says, suggest that the optimum route-mileage for the best efficiency is not more than 25,000 route-miles. By this measure all the world's big carriers must be hopelessly inefficient, and all the small ones too. The best measure of airline efficiency—i.e., what sort of "input" to set against what sort of "output"—has always been a tricky topic; perhaps the best measure is capacity ton-miles produced compared with load ton-miles achieved—but whatever it is, I don't think many would agree that it depends on the extent of operations.

London, S.W.5. J. P. M. BLACK.

Small Autopilot

IN your June 22 issue you referred, on page 820, to a new small autopilot developed by the Federal Telephone and Radio Company of New Jersey, U.S.A. Naturally we were very interested to read your short reference, and have a number of comments to make. We are prompted to comment more especially because of current advertising in the American aeronautical press by the Federal Company, in particular in *Aviation Age* for May, 1956, page 25. The advertisement claims a very great deal more than has been reproduced in your factual write-up.

We have since 1948 been producing a small lightweight automatic pilot for private and feeder-line aircraft, namely, the Sperry AL1A and AL3 Gyropilots. This was an all-British development, the price considerably less than the Federal price, and the weight about the same. The Sperry Gyropilots employ well proven gyro references, and with the exception of the radio coupler facility will carry out all the functions which are claimed for the FTR Type F200, i.e. the two-axis unit. The new Sperry AL30 Gyropilot such as we are installing in the Handley Page Herald is a development from the AL1A and AL3, and will considerably extend the range of aircraft into which this type of automatic pilot can be installed.

We are slightly amused by claims in the FTR advertisement that it is the "only tubeless" automatic pilot at the "lowest price," and that it is "the first in the field." All these feaures we can, I believe, justifiably claim for the Sperry Gyropilots, if we wished to.

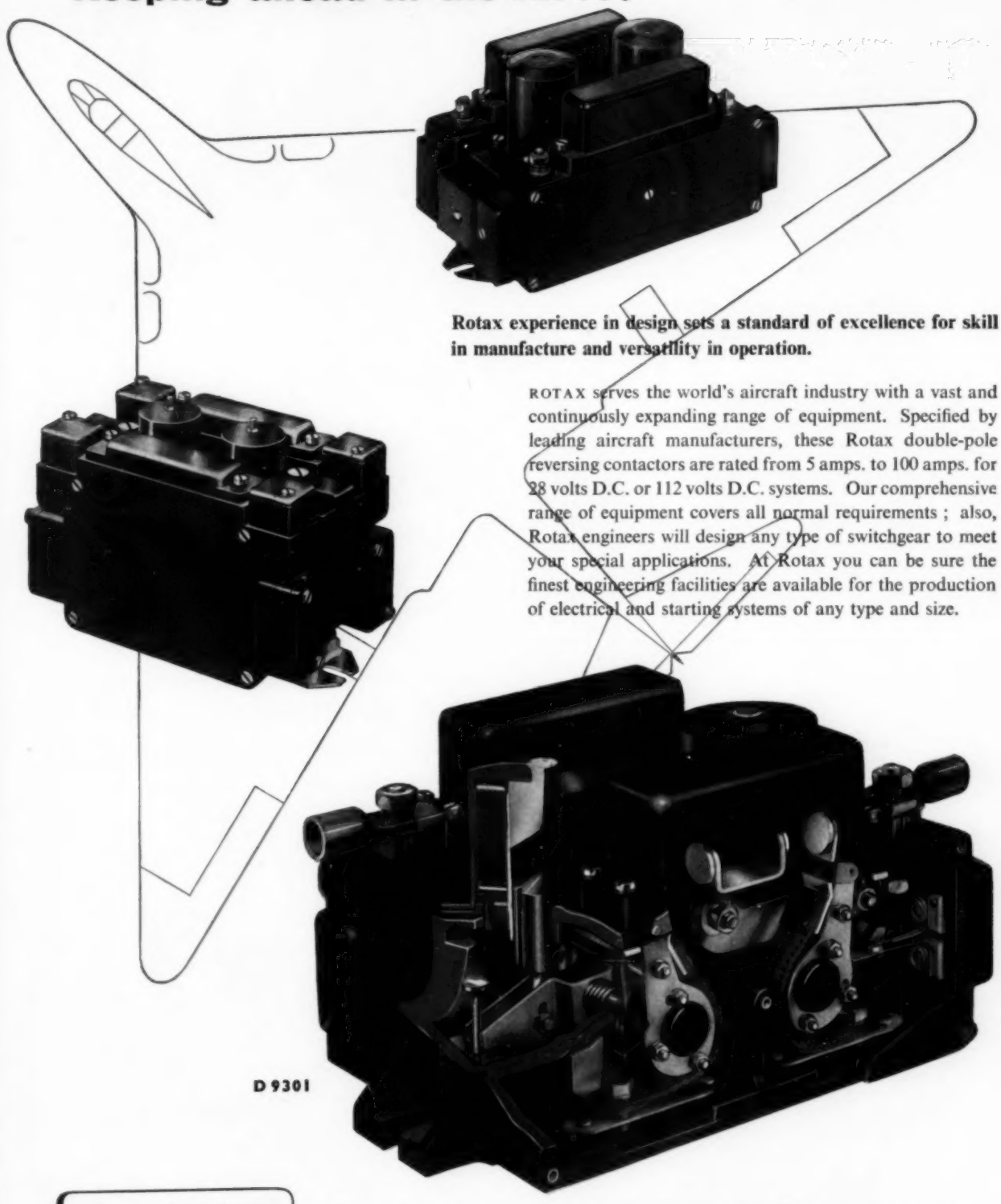
I would add that there is nothing in your write-up to which we can take exception, for it is entirely a factual report; but we felt that some comment from the British angle would be apposite.

THE SPERRY GYROSCOPE CO., LTD.
Brentford, Middx. K. I. T. Richardson,
Superintendent, Publicity Services.

FORTHCOMING EVENTS

July 14-25. International Gliding Competition, for the Coupe Jacques Coeur, Bourges.
July 18-22. Venice Aero Club: International Aeronautical Exhibition.
July 21: R.Ae.C.: National Air Races, Third Round (including King's Cup race and Lockheed Aerobatic Trophy, Baginton, Coventry.
July 21. R.N.A.S. Lossiemouth: At Home.
July 21. R.N.A.S. Anthorn: At Home.
July 22. Northamptonshire Aero Club: At Home.
July 22. Yorkshire Aeroplane Club: At Home.
July 28. R.N.A.S. Yeovilton: At Home.
July 28. R.N.A.S. Culdrose: At Home.
July 28. Helicopter Association: Rally and Garden Party, Ripley.
July 28-30. Livorno Aero Club: Air Rally.
Aug. 1-12. Central Aero Club of U.S.S.R.: World Parachuting Championships, Moscow.
Aug. 4. R.N. Air Station, Brawdy: At Home.
Aug. 5-6. World Power Model Championships, Cranfield.
Aug. 11. R.N. Air Station Lee-on-Solent: At Home.
Aug. 17-19. Sportsflyveklubben: International Rally, Denmark.
Aug. 25-26. Midland Aero Club: Air Rally, Elmdon, Birmingham.
Sept. 3-9. S.B.A.C. Display, Farnborough ("Public" days, 7th, 8th, 9th).

Keeping ahead in the Air...



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Ahead of the present — *— abreast of the future*

AP323-14

Day off from Westminster: the Parliamentary and Scientific Committee called on Handley Page, Radlett, on July 11. Subject for discussion here is the Herald—of which, incidentally, we shall be printing new details and a report of progress next week.

CIVIL AVIATION

I.C.A.O.'s TASK FORCE

THE most significant resolution adopted by the I.C.A.O. Assembly, which has been in session in Caracas since June 19 (there have been 250 delegates from 48 governments) was the proposal for an international "task force" to tackle the urgent problem of improving the world's air navigation facilities. As might be inferred, the proposal was moved by the U.S. delegate, General Wilson. Acting under the authority of I.C.A.O., the task force would be composed of six or seven experts, as yet unnamed, with a $100,000 budget and an "end-of-1957" target date for completion of studies.

A similar resolution, it is hoped, will be adopted to tackle the no-less-urgent matter of airports and runways. A data-gathering working group has been appointed by the I.C.A.O. technical mission. There will, no doubt, be close liaison here—as well as in the above field of navigation requirements—with I.A.T.A. (which recently concluded its ninth Technical Conference at Cannes) to avoid duplication of effort in getting the necessary requirements formulated and implemented.

An equally crucial problem before I.C.A.O. has been the question of financing improved technical facilities. The amount required in many cases is likely to be well beyond the means of the smaller countries, and ways of expanding the I.C.A.O. joint-financing system are being considered.

A PILOT'S POINT OF VIEW

THE July issue of the Journal of the British Air Line Pilots' Association *The Log*—a platform for the airing of pilot-opinion, mainly in matters affecting technical aspects of the profession—contains an article by Captain Howard Fry of B.O.A.C. In it he criticizes the Corporation's equipment policy, apportioning some of the "blame" for the "muddle" to Sir Miles Thomas, the former chairman.

Sir Miles, now chairman of Monsanto Chemicals, is reported to have commented that, rather than reply, he preferred to let the financial results during his period of office tell the story.

HOW TO RUN AN AIRLINE

THE growth of airlines from "an airplane or two, a few mechanics, a few pilots, and possibly a promoter and manager" to a complex structure of technical, operational and cost accountancy departments has resulted in the inevitable specialization of airline employees. A new book* sets out to examine, stage by stage, the particular function of the individual department upon whose efficiency as a whole the commercial success of an operator will depend, and to explain by definition and example the factors that constitute operational efficiency.

This is a major task, even when the references are confined to operations by American carriers, so that each of the sixteen chapters proceeds quite rapidly from an outline of a particular specialized field to detailed figures of tables and worked examples. Occasionally condensing is carried to extremes: "theory of flight," couched very much in layman's terms—"Many examples of this (lift) force exist, as in sticking a hand out of a moving car and watching it go up when tilted or feeling a tug on a kite string"—might well have been omitted.

Such condensing, useful for crammers, can be irritating; but in general a very even standard of presentation has been adopted. Through each chapter runs a cost-control thread (there is also a chapter on operating costs and revenues) constantly acting as a reminder of the commercial necessity of improved passenger service, loading technique or meteorological study.

In choice of subject matter the author has made few mistakes, and every aspect of technical management is covered in a quite comprehensive way. The many explanations given for the determination of operating factors such as take-off weights, pay and fuel loads, fuelling stops, power settings or utilization, are backed up by a great many charts and figures illustrating actual operations.

The final chapter provides an explanation of the functioning of turbojet and turboprop engines, and deals (a little cautiously as perhaps is warranted) with the economic and operational impact that modern gas turbine-powered aircraft will make upon airlines attuned to the operation of piston aircraft.

In providing a detailed picture of the technical aspects of airline operations for the airline departmental specialist or for the layman with some knowledge of aircraft engineering, this book succeeds very well, and could form a sound basis for further reading on the various aspects covered. A considerable number of illustrations of aircraft and aircraft handling methods—some of which are already familiar—have been included, and an index and brief conversion table are provided.

* *"Technical Aspects of Air Transport Management," by R. Dixon Speas. McGraw-Hill Book Company. Price 64s.*

MAINTAINING THE STANDARD

THE proposal, shortly to be discussed by I.C.A.O., that the system of issuing licences to aircraft maintenance engineers should be curtailed in favour of "approved organizations" has evoked sharp protest from the International Federation of Airline Pilots' Associations. The present licensing regulations are regarded by I.C.A.O. as being inconsistent with the degree of specialization nowadays required.

The pilot's objections, based on grounds of safety, are largely concerned with the loss of the personal responsibility that the holding of an engineer's licence involves. It is suggested that: "The engineer will eventually adopt the attitude that responsibility for his work rests with his employers. Furthermore, as time goes by, his employer will be more in a position to dictate what he must do in relation to servicing of aircraft . . . whereas under the present system he may refuse to certify work if he believes this work to fall below acceptable standards."

It is recognized, of course, that "approved organizations" already exist—the aircraft manufacturers for example—though these are cited as a special case: "The aircraft factory is a closely knit organization with a staff stably domiciled. [A reference to the high changeover rate of engineers at airline outstations.] . . . A further difference between the position of the aircraft manufacturer and that of the operator is that the former has his reputation directly at stake; if he sells a faulty product to the operator it is highly likely that the mistake will be discovered and its rectification charged directly to him. There is thus a safeguard against inferior products by means of a self-correcting economic relationship. In the case of the operator . . . the simple laws of contract do not afford the same guarantee of standards. In so far as the operator is selling anything it is 'safety' but, even here, he is selling it to a largely inexpert clientele whose judgment will take time to mature."

The Federation will be able to place their objections before the I.C.A.O. Third Air Navigation Conference in October. Meanwhile, proposals for an alternative scheme are being discussed.

Major effort: It seems no time since we saw the first Viscount 800 Major as a wingless shell in the Vickers factory at Hurn. Here it is as photographed last week, almost ready for flight trials.

In "Flight," June 15, we reported the opening of an airport at Lhasa, capital of Tibet. Constructed 10,000ft above sea level by the Chinese, it is seen here with its first two arrivals, both Il-12s (the one on the right appears to be an air force machine). The service from Peking —the first-ever air link with Tibet—takes ten hours.

CIVIL AVIATION . . .

NEW NAME IN AIR FREIGHT

A FREIGHT service, linking main centres in England with those in Belgium, has just been put into operation. The service, named "Trukair," will be operated jointly by Air Charter and Atlas Air Services, and will integrate the existing Express Carrier system throughout the United Kingdom. The system is co-ordinated for air freight by Atlas Air Services, with the cross-Channel air ferry service operated from Southend by Air Charter. Exporters' goods will be collected from their door by lorry, and despatched by road to Southend Airport. There the goods will be cleared through Customs and flown on Bristol Mark 170 freighters across the Channel to Ostend, from where they will be delivered by a reciprocal road transport system to the door of the consignee.

The operators claim that transit time, from pick-up to delivery, will not exceed 40 hours, and in many cases will be substantially less. They also claim that their comprehensive rates will be more than competitive with comparable express surface transport.

This important new development enables British exporters to bring their continental deliveries into line with home distribution, and is also the first example of a service jointly operated by free enterprise road and air services.

THOSE JET AIRPORTS

AN enlightening document just issued by Boeing describes the airport behaviour of the 707. Its purpose is to assist the airport planners, and it covers servicing, loading, refuelling, ground manœuvrability, the effects of jet blast, noise, fuel spillage, and runway length and strength. It is apparent from a study of the document that Boeing's great airliner will present few difficulties—with the possible exceptions of runway length and strength.

It is of interest to see how three European airports, Paris (Orly), Brussels and Frankfurt—all of which are certain to be used for 707-320 full-load (295,000 lb) take-offs—match up to the 707-320 charts presented. Applying the appropriate temperature, elevation and paved length data (published in our May 4 issue, in which we assessed the suitability of 58 major world airports and their alternates for the 707 and DC-8) it appears that the following approximate extensions would be required: Paris, 2,000ft; Brussels, 1,500ft; Frankfurt, 3,000ft. It is perhaps difficult to reconcile these results, which are typical of others, with the brochure's indication that lengthening will be necessary at only a very few terminals. It seems more likely that, if the world is to exploit fully and regularly the great intercontinental capabilities of the 707, many more than a "few" airports will have to look to their lengths.

Again, from the point of view of runway *strength*, it is possibly questionable whether the factors for the derivation of "equivalent isolated single wheel loads" assumed are as realistic as those recommended by I.C.A.O. (Annex 14). Gross weight factors of 0.18 (flexible pavement) and 0.15 (rigid pavement) are used, compared with the 0.22 recommended by I.C.A.O. This latter produces a gross weight "e.s.w.l." of about 64,000 lb, a load which could not be accommodated by about a half of the 58 airports previously examined. While it is true that the "e.s.w.l. for the 707-320 is less than that for the DC-7C or the B-377 at equivalent gross weights," it is equally true that the 707-320 has been bought for operation at weights more than 150,000 lb heavier.

BREVITIES

DART engines have now flown 1.25 million hours, a total which is increasing at the rate of 100,000 hr per week. Overhaul life is now up to 1,050 hr.

* * *

The Boeing 707 prototype, now fully furnished, has completed 500 hr flying.

* * *

Air-India is now reported to be considering the purchase of two Boeing 707s.

* * *

Mr. R. W. Ryan, a vice-president of C.P.A.L., has been appointed executive vice-president and director.

* * *

The opening of an attractive new restaurant and bar at Shoreham Airport was celebrated on July 11. Mr. F. G. Miles welcomed the guests.

* * *

A memorial is to be built at London Airport to mark the historic return crossing of the Atlantic by the British airship R.34 thirty-seven years ago this month.

* * *

S.A.S. is expected to obtain a loan of more than £10m from American insurance companies to help pay for the seven DC-8s on order.

* * *

First sign of B.W.I.A.'s expansion programme (*Flight*, May 18) was the opening recently of a new airways terminal building in Port of Spain.

* * *

Mr. Gaston Naniche, a Frenchman who is B.E.A.'s station superintendent at Nice, has been awarded an honorary M.B.E. for his services to British civil aviation during the last 20 years.

* * *

Air Ceylon have put forward a proposal to make Katunayake—which the R.A.F. is to relinquish—the country's main civil airport to replace Ratmalana. The government is resisting the proposal.

"The first steel pile" was driven into the shore of the Hudson River on July 10, marking the start of construction of New York's big new heliport.

* * *

Morton Air Services are to operate, as from September, the first link between London and Rotterdam for twenty years. Their licence permits the operation of three return services a day from Croydon. Doves will be used.

* * *

Mr. D. Malcolm Brown, at present sales development manager of B.O.A.C., has been appointed general manager of West African Airways Corporation, and will take up his new appointment at Lagos, Nigeria, shortly.

* * *

Lufthansa will open their South American service, between Hamburg and Buenos Aires, on August 15. The Super-Gs will be first class 40-seaters, with a special new interior colour scheme. Connecting points will be Dusseldorf, Paris, Dakar, Rio, and Sao Paulo.

* * *

B.O.A.C. are reported to be negotiating with the Straits Steamship Company to buy shares in Malayan Airways, which is to become a public company. Although a controlling financial interest will not be obtained, it is likely that operational control will be exercised.

* * *

The world's second scheduled jet airliner service will start next month when Aeroflot introduce Tu-104s on "routes to the east." The service to Omsk on May 24 (*Flight*, June 1) was presumably the first of a number of proving flights which have been in progress. The Tu-104 (now named Silver Arrow) has just flown from Moscow to Khavarovsk, 4,000 miles, in 10 hr.

* * *

A Convair 440 Metropolitan, on a delivery flight from San Diego to Zurich, crashed on the approach to Shannon Airport on July 15. The aircraft, HB-IMD, was the third of 11 for Swissair (see last week's *Flight*). The crew of four—two American pilots, an American engineer and a Swiss navigator—lost their lives.

HUSKY ROLE FOR THE LEONIDES

THE promising Canadian-designed Fairchild F-11 Husky, which first flew in 1946, may soon be available again according to Canada's aero trade magazine *Aircraft*. Responsible for the revival is the newly formed Husky Aircraft, Ltd., who will power the new Husky with an Alvis Leonides 503/8 engine in place of the former Pratt and Whitney Wasp Junior R-985, with a resultant increase of take-off power from 450 h.p. to 560 h.p. A de Havilland three-bladed 11ft airscrew will be fitted (the installation will be similar to that of the Prince, Pembroke, Twin Pioneer and Beaver 2).

The prototype installation of the Leonides in an airframe was begun in March in the Sea Island shops of Vancouver Aircraft Sales, Ltd., and the first test flight—by A. M. McKenzie, vice president of Husky Aircraft—should take place this month. Although modifications have so far been confined to redesign forward of the firewall, it is anticipated that additional fin area may be required to compensate for the increased power. Production of the Leonides Husky (on the lower British Columbia mainland) will depend upon flight-test results, but a marked improvement in take-off and climb performance is expected, in addition to a higher cruising speed and a slightly increased range with the same tankage. Besides manufacturing new aircraft the firm would offer conversion kits to the owners of the eight Huskies still in operation.

A feature of the Husky is its many doors—two for access to the cockpit, a cargo loading door 40in wide by 48in high each side, and a further trapezoidal loading door in the steeply sloping floor of the rear fuselage.

Mr. Wheatcroft's Plan for Europe

WE reviewed last week the first part of Mr. Stephen Wheatcroft's book, "The Economics of European Air Transport," in which he analyzes the reasons for the poor economic health of the European airline industry. We review here his proposals for economic regulation.

THE two prime needs of European air transport, Mr. Wheatcroft reasons, are (1) higher intensity of traffic flow, and (2) reduced costs. His proposals for a reduction in costs—perhaps as much as 30 per cent—were examined in the previous issue: here we study his suggestions for the means by which higher intensity of traffic flow can be achieved.

The economics of short-haul routes suffer from low block speeds and high terminal costs; and while steps can be taken to alleviate these disadvantages, they can at least be offset, if higher traffic flow exists, by the advantage of large capacity aircraft and higher frequencies. These lead to lower operating costs (1) because of the lower operating costs per capacity ton-mile of the larger aeroplane, and (2) because of the high utilization resulting from the larger volume of traffic.

How is higher density of traffic flow to be achieved? The elimination of "certain low frequency direct connections" and the closing of "certain airports" may be shown to be to the ultimate benefit of the travelling public; but while it is difficult to imagine such arguments—however convincing—surmounting considerations of national and civic pride, it seems sound sense to let low intensity direct services atrophy by the provision of improved connecting services at higher frequencies, and perhaps lower fares. The author's further suggestion concerning the co-operation of adjacent cities in the joint provision of airport facilities does not seem so practical: it would invariably mean the construction of new airports (even if a site could be found) and the provision of new roads and railways. Again, it is hard to imagine governments foregoing cabotage rights (see later); but one of the most important results of such action in the route-pruning process would be a reversal of the wasteful tendency of airlines to run direct services to avoid the cabotage sectors—an accumulative tendency, since it encourages other direct services to be run in competition.

The prevailing system of European air transport is undoubtedly failing to provide the basis for *intensive* expansion. In his examination of the requirements for an improved system, the author's dominant theme is that above all it should take the form of a "publicly accountable" authority. Here the influence of the U.S. Civil Aeronautics Board's experience is most strongly detected: "The airlines," says Mr. Wheatcroft, "should regard it as their prime function to compete one with another in providing the best standard of service and in their endeavours to develop their own traffic to the maximum extent. Where it is necessary and desirable that airline competition should be restricted in order to protect other aspects of public interests it is by government action and not private agreements that these restrictions should be effected."

Before proposing the form which such a "publicly accountable" authority might take the author suggests ways in which the airlines might regulate economy themselves by various kinds of co-operation.

A measure of co-operation, Mr. Wheatcroft suggests, is not incompatible with competition, and he puts forward three kinds of co-operation which he considers would be of particular economic benefit. The first measure would be directed towards making it easier to sell air transport, and for the passenger and the shipper to use the air services. Uniformity and standardization of commercial practices—tickets, baggage checks, waybills and so forth—has already been taken a long way, through I.A.T.A.'s efforts, but still offers much scope for further streamlining. The second suggestion for better co-operation appears to be less sound. Describing it as investment planning, Mr. Wheatcroft proposes that a balance should be enforced between the estimated future air traffic and the potential capacity that the airlines are intending to acquire. The economic benefits such a scheme might ensure are not too convincingly presented: but even assuming that they are indisputable, the weakness of any such form of regulation seems to be that it is based on prediction. Restriction in any form invariably encourages the devising of "dodges"—and when it is based on prediction and not upon facts, it is even more open to evasion. The "agreed estimates" which the author suggests would leave ample room for competition would probably in practice involve laborious route-by-route negotiations, which might well break down under the urgent pressures of the need to "get in the queue." There is also the imponderable consideration, which the scheme does not take into account, that capacity itself can indirectly generate traffic.

Without doubt, however, an opportunity exists for co-operation in the field of traffic handling. Having shown earlier that low station utilization is one of the root causes of European air transport's economic problem, the author proposes the establishment of specialized agencies, a suggestion which deserves the closest examination. There would be questions that required "different answers in different places," but the formation of a joint company sponsored by the airlines concerned—but independent of each in its operation, so as not to lower the competitive temperature—would not only offer direct economies but might also, by providing accommodation in which all the airlines could have their sales offices, effect economies by reducing the overheads of separate airline offices.

The author examines other opportunities for co-operation and concludes that there is scope for the greater standardization and mechanization of ticket-accounting; the setting-up of joint spares-holdings by airlines which use the same type of equipment and also the joint operation of maintenance facilities at out-stations; joint training and the co-operative use of flight simulators; and in the bulk purchase, mainly by the smaller airlines, of fuel and oil supplies.

What form of organization would enforce the economic regulation suggested by Mr. Wheatcroft? This formidable question is answered in the concluding, and most important, part of his book. The proposal is that the European Civil Aviation Conference (the European associate of I.C.A.O. set up at Strasbourg in 1954) should have its constitution revised and expanded to study and implement the necessary measures. The fact that an existing organization, which has proved to be sound and flexible, is suggested as the basis of the organization is undoubtedly its greatest merit.

It would remain a delegate conference consisting of high level officials of the participating States, and would be the parliament of the proposed organization, exercising a legislative function in its powers to amend the multilateral agreement. What multilateral agreement? it may be asked. None exists, notwithstanding the progress made at Strasbourg in 1954 and 1955. But Mr. Wheatcroft anticipates this question: "It is not true that the surrender of sovereignty is an indispensable condition for achieving the objectives of multilateral route-planning. The creation of a multilateral agency for this purpose is an indispensable condition, but the work of this agency may be reasonably effective without supranational authority provided that it is able to rely fully upon the goodwill of the participating countries, and providing that they understand, and are in sympathy with, the objectives of its planning work."

The crucial task of studying European traffic flows and the planning of a more consolidated route-network would fall to a specially formed agency of the European Civil Aviation Conference, which Mr. Wheatcroft calls an air transport commission. Its terms of reference would be advisory, and its success would depend upon the goodwill of the States and the understanding of the economic conditions it would be aiming to improve. (Its function would be similar to that of the Air Transport Advisory Council in the United Kingdom.) The proposal that this air transport commission would further supervise tariffs does not make quite clear the way in which it would be geared to the existing I.A.T.A. machinery; but there is no disputing the excellence of the proposal that the commission should undertake the compiling of statistical and financial data to enable governments to make a proper assesment of the tariff rates submitted to them for approval. There is no doubt that governments do not these days have sufficient data to allow them to form valid judgments of the rates which they have to approve or disapprove.

The author examines the relationship between the proposed organization and the existing ones and concludes that there need be no difficulty. There would be little disagreement with this reasoning, or with the suggestion that a European airline organization might be encouraged—under the ægis of I.A.T.A.—to gather around the nucleus of the admirable and firmly established Air Research Bureau. This organization, formed in 1952 by Air France, K.L.M., Sabena and Swissair and later joined by B.E.A. and S.A.S., is devoted to the study of common problems with particular reference to the analysis of traffic.

The author's conclusion is worth quoting: "The organization framework proposed for the economic regulation of air transport in Europe is fairly extensive and perhaps rather complex. It can claim, however, that it has the possibility of being developed into a full system of supranational control and yet, at the same time, may operate effectively in the present conditions in which the States jealously guard their sovereign rights in air transport affairs. It may also claim that it has its roots in the present institutions of European air transport co-operation and is a logical development of steps which have already been taken." J. M. R.

(*Editorial comment: page 105*)

Above is Wellington T.10 number MF628, the last of 11,461 "Wimpeys," recently presented to the Royal Aeronautical Society by Vickers-Armstrongs, Ltd. On the left are two gallant Captains of different Services — B.O.A.C.'s O.P. Jones, and Edgar Percival, ex-R.F.C. and R.A.F. and now managing director of Edgar Percival Aircraft.

AT THE GARDEN PARTY

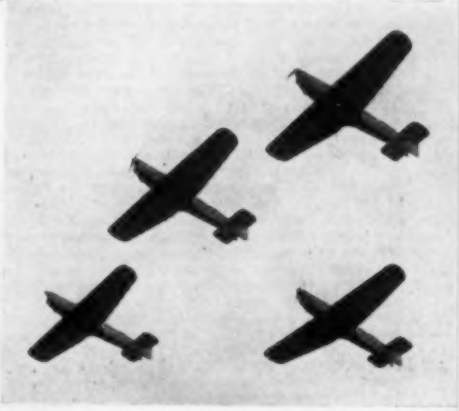
(See page 107)

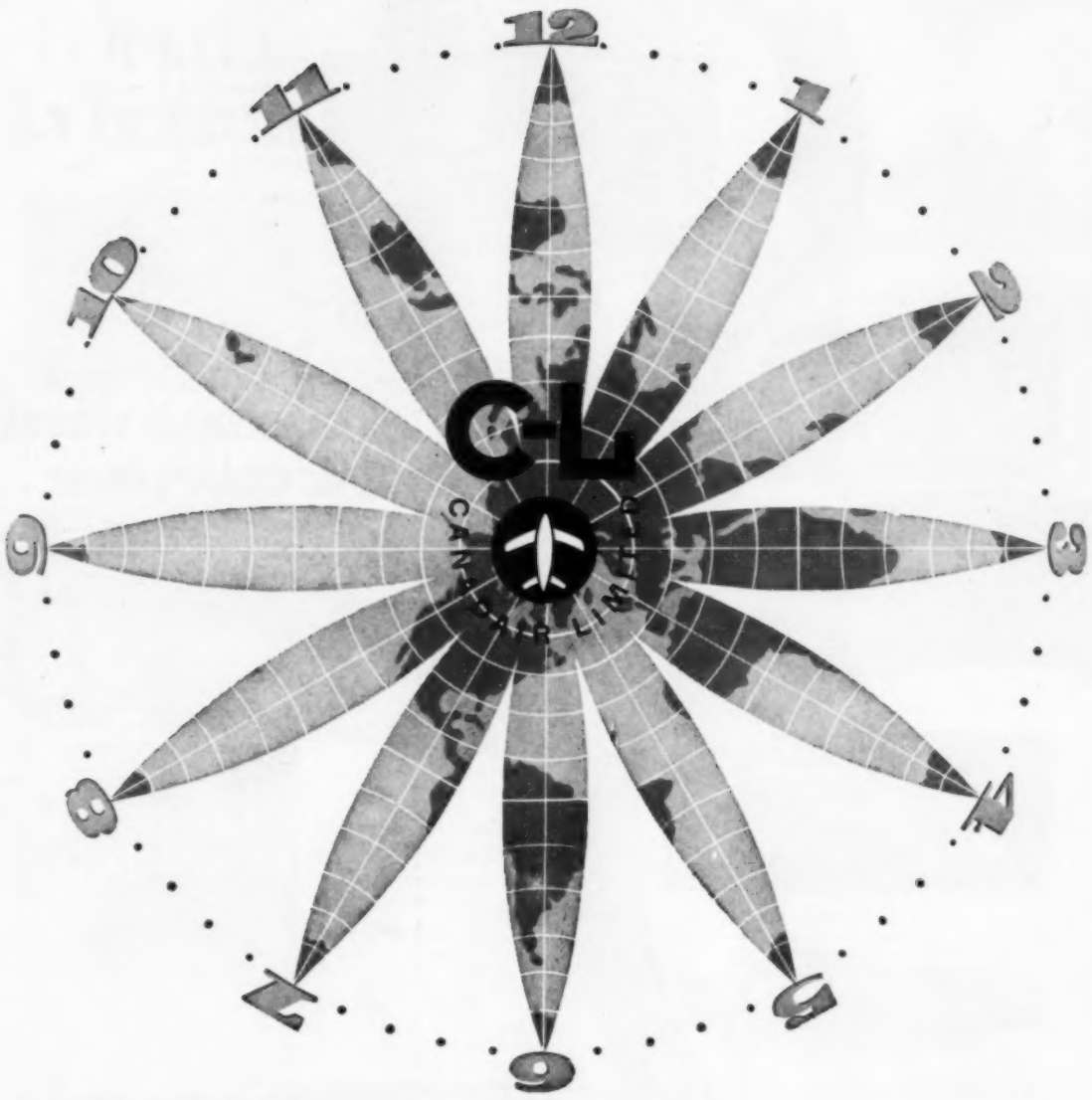
("Flight" Photographs)

(Above) Sir Frederick and Lady Handley Page are cordially received by Mr. E. T. Jones, the president, and Mrs. Jones.

(Below) The four Magisters of Derby Aviation, Ltd., which rendered an immaculate display of formation flying.

(Above) Fairey's private Fulmar, G-AIBE; (below) the company's own Swordfish, G-AJVH.





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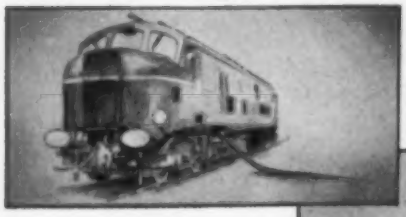

By land or by air Lockheed-Avery pressure replenishing couplings make for speedy, safe refuelling.

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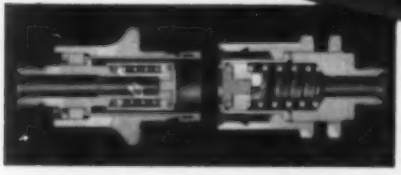
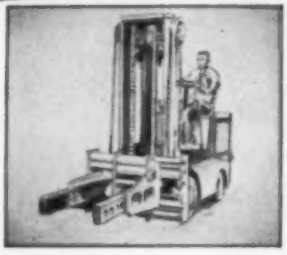
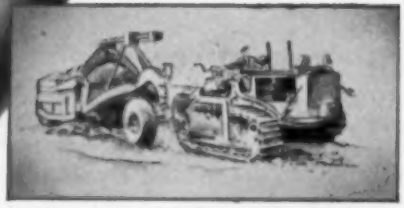


Replenishment couplings for the pressure replenishment of oil or fuel tanks enable a very high rate of flow to be used with safety and with considerable saving of the time required for refilling.

Lockheed-Avery hoses add dependability to your mechanical handling equipment. More work—fewer breakdowns.





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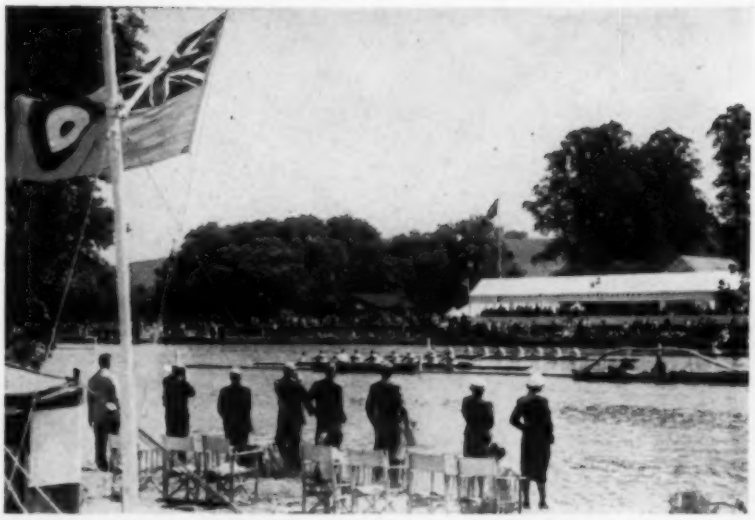
SERVICE AVIATION

Royal Air Force and Fleet Air Arm News



At Henley: The R.A.F. eight, farthest from camera, leading in the semi-final of the Thames Cup against Poplar, Blackwall and District R.C. In the final they lost by a length to Princeton University, U.S.A. The R.A.F.'s only win was the Double Sculls by S. C. and W. H. Rand.

Senior Appointments

IT is announced that A.V-M. Sir John Whitley is to be Air Member for Personnel, with the acting rank of air marshal, in succession to Air Chief Marshal Sir Francis Fogarty, who will be retiring from the Service next January. This supersedes the announcement that A.V-M. Whitley was to succeed Air Marshal Sir Thomas Pike as D.C.A.S. This post is at present held on an acting basis by A.V-M. G. M. Tuttle, with the acting rank of air marshal.

A. Cdre. R. C. Field has been appointed Air Officer in charge of Administration at H.Q. Home Command, to succeed A. Cdre. H. I. Cozens, who is retiring in August. A. Cdre. Field was previously Director of Administrative Planning at Air Ministry. He is to be succeeded at Air Ministry by A. Cdre H. Eeles, who was till recently A.O.C. and Commandant of the R.A.F. College, Cranwell.

Exercise "Rat Trap"

DUTCH observer corps posts were being tested last week in Exercise "Rat Trap." Aircraft from the R.N.A.F., from 2nd T.A.F. and from many commands in England flew over Holland to give the Dutch observers practice in reporting and plotting attacking aircraft at all heights. Among aircraft due to participate were Meteors, Venoms, Canberras, Varsities, Shackletons and Gannets.

New Mess for Valley

A LARGE new officers' mess building for R.A.F. Valley, overlooking Lake Llyn Penrhyn, will be completed in about a year's time. It will be three storeys high, and have an aluminium roof. The foundation stone is to be laid next Wednesday by Lady Williams-Bulkeley, wife of the Lord Lieutenant of Anglesey.

C.F.S. Association Dinner

AT Little Rissington, Glos., present home of C.F.S., the unit's association held its annual dinner and reunion recently. Many old members were present and talk of Avro 504s and of the years between then and now was to be heard on all sides.

After an excellent dinner, accompanied by the playing of the station band, Air Marshal Sir John Baldwin, the Association's president, moved the toast of C.F.S. He noted that this was the first reunion without Lord Trenchard and proposed that a trophy should be instituted in his memory and presented by the association for competition in C.F.S. It was strongly recommended, and approved by those present, that it should be presented for some form of team achievement in recognition of Lord Trenchard's belief in co-operative effort.

The Commandant, A. Cdre. N. C. Hyde, replying for C.F.S., thanked the association for a magnificent enamelled crest, which was then unveiled by "Mr. Vice." He summarized the School's progress during the last year and mentioned in particular its aerobatic team of Meteor 7s which had performed with distinction at Le Mans and at the Farnborough Jubilee celebrations. The Examining Wing was progressing in the helicopter field and had made a number of visits to R.A.F. theatres abroad and to foreign air forces.

Among the many distinguished guests were the A.O.C.-in-C., Air Marshal R. L. R. Atcherley (who has since been knighted), Rear Admiral Evans, Flag Officer Training, Air Chief Marshal Sir James Robb, A.V-M. G. D. Harvey, A.V-M. Brooks, A.V-M. W. C. Sheen, A.V-M. J. Cox, A.V-M. Bowen Buscarlet and Mr. W. E. P. Johnson.

No. 17 Sqn. Re-formed

AT R.A.F. Wahn, Germany, No. 17 Sqn. is re-forming with Canberra P.R.7s. The first aircraft arrived last month and a Mobile Field Photographic Section will be attached to the squadron. During World War I the unit served in the Middle East and in World War II it took part in the Battle of Britain and the Burma and Far Eastern campaigns.

Some Relay

THE police dog training unit at Wahn took part in a strange relay race at the Cologne annual police dog sports recently. The R.A.F. team consisted of a police dog, a cyclist, a man running an obstacle race, a motor cyclist and a horseman. The Wahn team came fourth.

Badge for R.A.F. Records Office

HER MAJESTY THE QUEEN has graciously approved a unit badge for the Royal Air Force Record Office, based at Gloucester. The badge shows a scroll in front of a torteau (a red roundel or disc). The scroll is symbolic of the records and papers held in charge of the Record Office and the torteau is taken from the arms of the City of Gloucester—suggesting the location of the station. The motto "Ad Omnia Ordinanda" can be translated as "For the purpose of arranging everything in order."

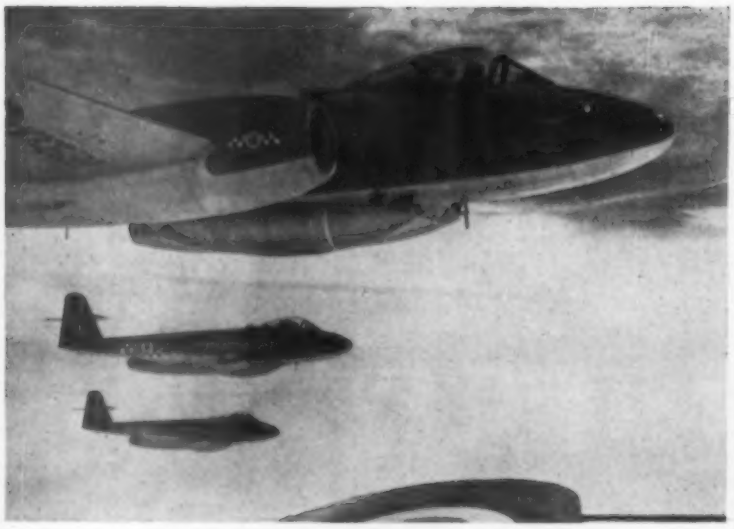
Freedom of Southport

IN the report of the granting of the freedom of Southport to No. 2611 (West Lancashire) Sqn., R.Aux.A.F.Regt., A.V-M. B. C. Yarde was mistakenly identified as A.O.C. No. 63 Group instead of Commandant General of the R.A.F. Regiment and Inspector of Ground Combat Training.

Annual Dinner

THE annual dinner of the R.A.F. Medical and Dental Branches will be held on November 16 at the Royal College of Surgeons, Lincoln's Inn Fields, London. Past and present officers are eligible, dress is evening dress or dinner jackets with decorations; and tickets will cost 30s. Details from the Honorary Secretary and Treasurer, R.A.F. Medical and Dental Services Dinner Fund, Air Ministry (M.A.3), 2-8 Richmond Terrace, London, S.W.1.

This baby elephant, being restrained by R.A.F. personnel, wandered into Fort Telanok in Malaya some time ago. It was fed and cared for and recently evacuated in a Whirlwind of No. 155 Sqn. to be brought up at the game warden's base at Temerloh, Pahang.



No. 19 Squadron is at present equipped with Meteor F.8s, at Church Fenton. The formation at left was photographed by a member of the unit from a Meteor NF.14.

At Church Fenton, Air Chief Marshal Sir Donald Hardman presents a Standard to No. 19 Sqn. (right), as related on this page.

SERVICE AVIATION . . .

The Queen at Marham

NEXT Monday, July 23, the Queen and the Duke of Edinburgh are to visit the R.A.F. bomber station at Marham, Norfolk, to present a Standard to No. 207 Sqn., which operates Valiants there. Many aircraft will be on show for the occasion, and the static display will include a Victor and a Vulcan, eight Valiants and 26 Canberras. Another Valiant, from No. 214 Sqn., will be seen in a hangar with its equipment. After the Standard presentation there will be a fly-past by 20 Valiants and 72 Canberras.

No. 19 Sqn. Standard

A STANDARD was presented to No. 19 Sqn. last week at Church Fenton by Air Chief Marshal Sir Donald Hardman, who was a member of the unit nearly 40 years ago. The squadron was formed in 1915 and, shortly before World War 2, was the first to receive Spitfires. These it operated in various marks until 1944, when Mustangs were issued. Meteors form the present equipment, and the C.O. is S/L. D. J. Fowler. After the ceremony and formalities, Sir Donald drove to his aircraft in the squadron's specially decorated and marked London taxi.

Colour for the F.A.A.

AT Lee-on-Solent on July 30, the Queen is to present her Colour for the first time to the Naval Barracks there, in recognition of the size and status of the Fleet Air Arm. The R.N. Barracks, Lee-on-Solent, is the depôt for the Fleet Air Arm.

The occasion will be marked by a fly-past of more than a hundred Naval aircraft, including helicopters, Gannets, Wyverns, Sea Hawks, Sea Venoms and Attackers from some 14 squadrons, both regular and R.N.V.R.

Schoolmaster to Five V.C.s

AN Air Ministry civilian ground instructor who has helped to train nearly 8,800 pilots, including five who were awarded the Victoria Cross, has now completed 21 years' continuous service with No. 6 Flying Training School, based at R.A.F. Tern Hill, Salop. He is Mr. Frank Sibborn, an instructor in aerodynamics.

Antarctic Test

TRIALS lasting two weeks are being carried out in Canada by three R.A.F. officers on the D.H. Otter which is to be used by the British Trans-Antarctic Expedition in their bid to cross Antarctica. The Otter, which with overload tanks can remain airborne for almost 14 hours, is to be used to reconnoitre the terrain and seek out routes from Vahsel Bay to Ross Bay, passing over the South Pole itself. The aircraft can take off and land with floats, skis or on wheels.

The tests will be made by S/L. John Lewis, A.F.C., a war-time night-fighter pilot and commander of the R.A.F. party with the expedition; with him are F/L. Gordon Haslop, a New Zealander in the Service since the war, and S/L. R. Seymour, senior navigational instructor at the R.A.F. Flying College, Manby. S/L. Lewis and his companions, who left London for Toronto on June 27, are flying the Otter back to this country—for final working-up—*via* Greenland and Iceland.

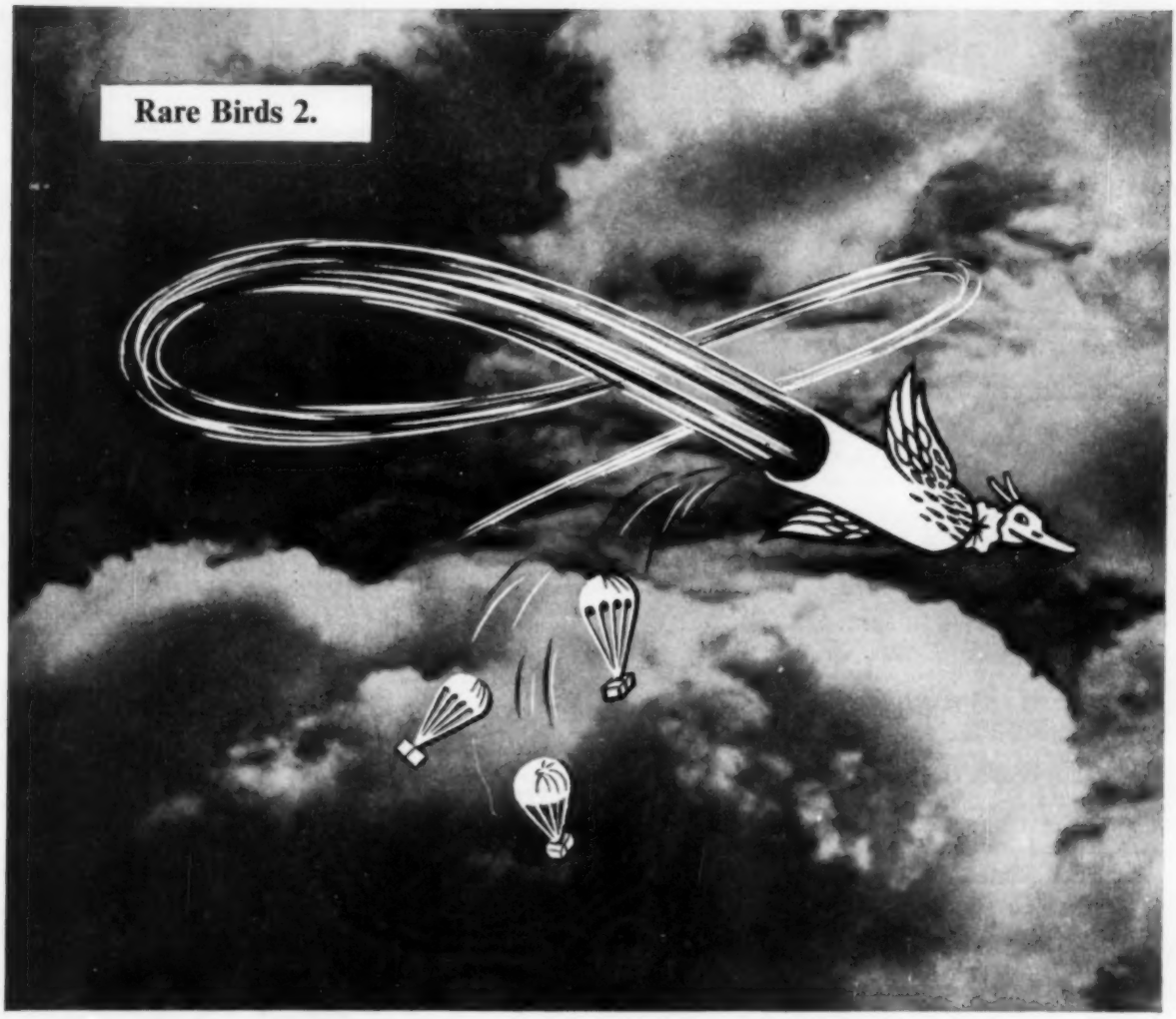
The Auster which was flown off patches of cleared water and used in the vital air reconnaissance which helped the M.V. *Theron*, will operate in conjunction with the Otter. Both machines will be carried aboard the new expedition ship, *Magga Dan* when the main party—which includes S/L. Lewis and F/L. Haslop—leaves London on November 14.

Royal Air Force Appointments

THE following continues the list of Royal Air Force appointments recently issued by the Air Ministry:—

S/L. W. F. Adams to Ministry of Supply (with the acting rank of wing commander); S/L. R. H. Fry, D.F.C., to Air Ministry, for duty in the Department of the Air Member for Supply and Organization (with the acting rank of wing commander); S/L. G. E. F. Goode, O.B.E., D.F.C., to R.A.F. North Weald, for administrative duties (with the acting rank of wing commander).

A considerable number of Australian-built Canberras are now in service with the R.A.A.F. Some—like the one flying past below—are T.4s, but most are B.20s. These machines are lined up at No. 82 (Bomber) Wing's base at Amberley, Queensland.



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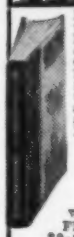

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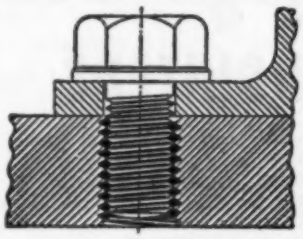

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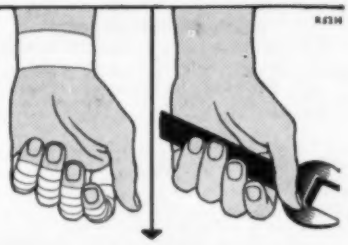

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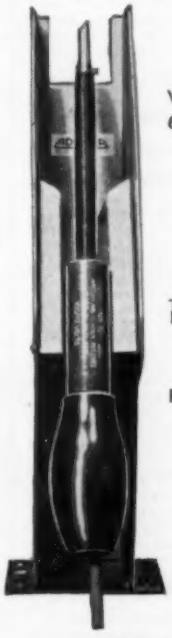

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PUBLIC ANNOUNCEMENTS

AIR TRANSPORT ADVISORY COUNCIL

THE Air Transport Advisory Council give notice that they have received the undermentioned applications to operate scheduled air services:—

APPLICATION No. 806. From Air Kruise, Ltd., of 1, Great Cumberland Place, London, W.1, for a seasonal U.K. Internal Service with Bristol 170 and Dakota aircraft for the carriage of passengers, supplementary freight and mail between Lydd and/or Blackbushe and Jersey at a frequency of two return flights on Fridays, and four return flights on both Saturdays and Sundays during the season from June to September inclusive, each year, for a period of 10 years, commencing 1st June, 1957.

APPLICATION No. 22/2. From Cambrian Airways, Ltd., of Cardiff (Rhoose) Airport, near Barry, Glam., for amendments to the terms of approval of the seasonal U.K. Internal Service which they are approved to operate between October and March each year for the period until 30th September, 1963, on the route Manchester-Cardiff and/or Bristol-Guernsey and/or Jersey, so as to operate services throughout the year, and for traffic rights at all points on the route. The company also ask for permission to operate direct flights between any of the centres served.

APPLICATION No. 807. From Airwork, Ltd., of Blackbushe Airport, Camberley, Surrey, for a Colonial Coach Class Service with Hermes Mark IV A aircraft for the carriage of passengers and supplementary freight between London Airport and Singapore with intermediate technical stops at Brindisi, Beirut, Bahrain, Karachi (nightstop), New Delhi, Calcutta (nightstop) and Bangkok, at a frequency of one return flight weekly increasing further according to traffic demand up to seven return flights weekly for a period of seven years, commencing 1st April, 1957.

APPLICATION No. 428/1. From Airviews, Ltd., of Manchester Airport, Wythenshawe, Manchester, for an amendment to the terms of approval of the seasonal U.K. Internal Service which they are approved to operate for the period up to 31st October, 1961, on the route Manchester-Bristol (optional)-Cardiff (optional technical)-Newquay, so as to operate also a terminating service on the sector Manchester-Bristol.

THESE applications will be considered by the Council under the Terms of Reference issued to them by the Minister of Civil Aviation on 30th July, 1952. Any representations or objections with regard to these applications must be made in writing stating the reasons and must reach the Council within 14 days of the date of this advertisement, addressed to the Secretary, Air Transport Advisory Council, 3, Dean's Yard, London, S.W.1, from whom further details of the applications may be obtained. When an objection is made to an application by another air transport company on the grounds that they are applying to operate the route or part of route in question, their application, if not already submitted to the Council, should reach them within the period allowed for the making of representations or objections. [5514

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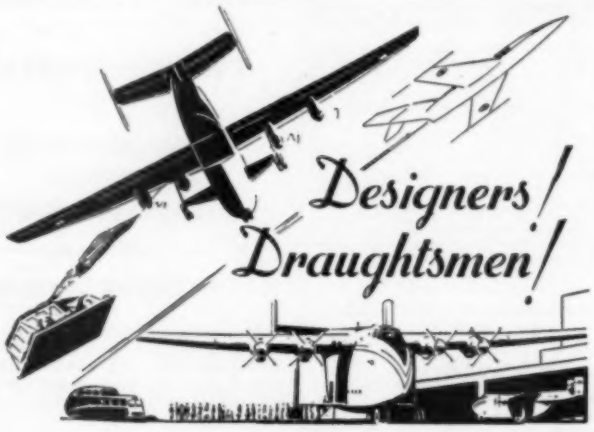

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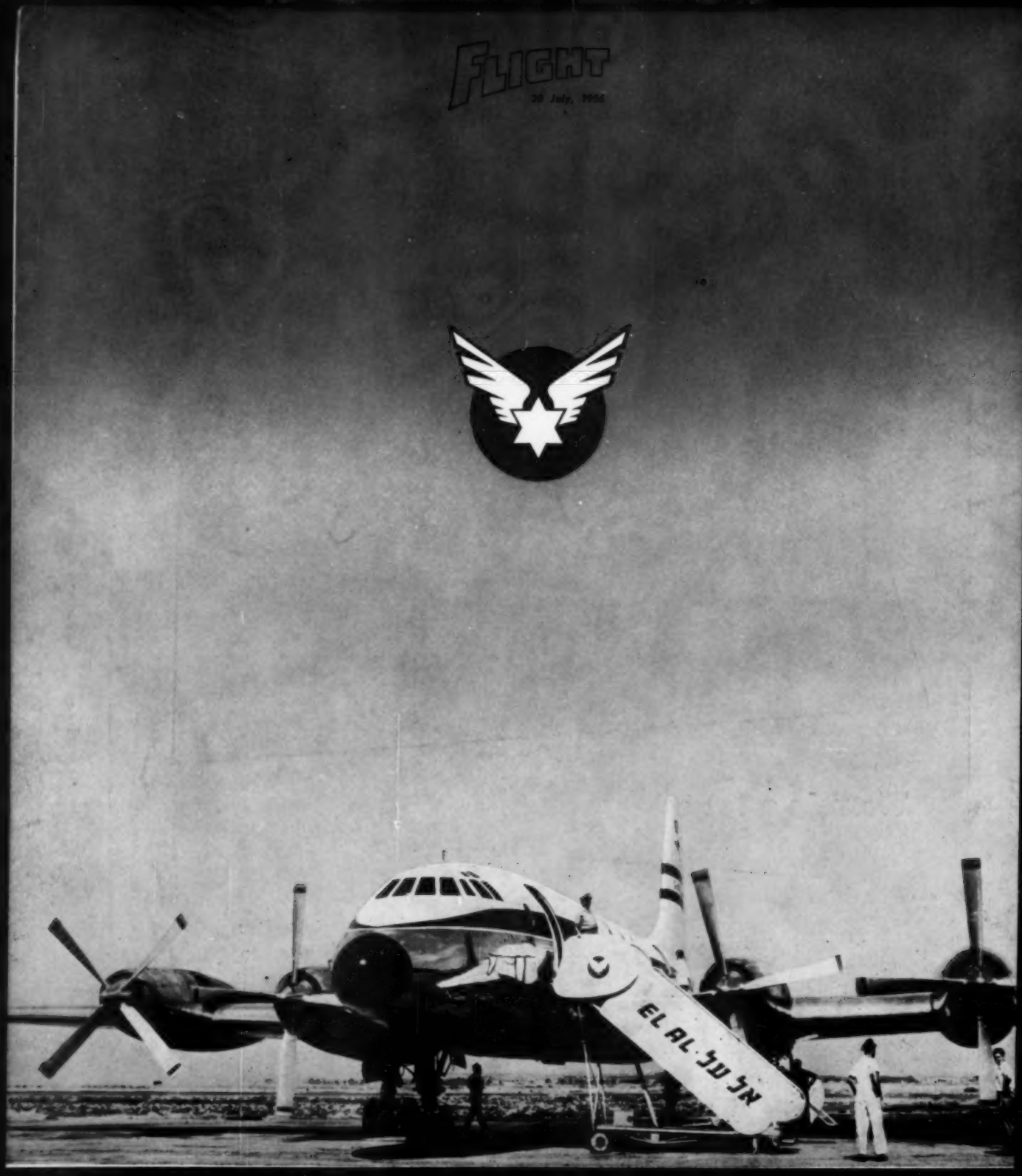

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